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TO

H. H. RISLEY, Esq., C.I.E.,

Officier d'Académie.

My dear Risley,

Wherever my search for the plants of Bengal has led me, I have found myself following your footsteps in the study of the folks that dwell in the Lower Provinces and live in the pages of the *Tribes and Castes of Bengal.*

Will you, then, accept this work as a mark of my appreciation of yours, and a token of my warm regard?

Yours very sincerely,

D. PRAIN.

MINISTRY OF CULTURE · GOVERNMENT OF INDIA

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PREFACE.

Ten years have passed since the suggestion that the writer should prepare a guide to the plants of the provinces under his rule was first made by Sir Charles Elliott. The work could not, however, be undertaken till the *Flora of British India* was finished; since then it has occupied the scanty leisure of the writer, who has received much encouragement from Sir Joseph Hooker, Sir George King, and Sir John Woodburn to carry it to completion.

Its many imperfections—due in some measure to the fact that *dies fasti ac feriati* have alone been available for its preparation, and that on these it could only receive divided attention—must have been more numerous had not Sir George King, with a kindness which nothing can repay, read the final proofs.

The key to the species of *Polygonum* was drawn up by the writer's friend, Captain A. T. Gage. The need for an Appendix is mainly the result of a practical interest in the progress of this work on the part of Mr. J. H. Lace and Mr. H. H. Haines, who have communicated records of species unknown to the Lower Provinces when its preparation began. The writer is also much indebted to Messrs. West, Newman & Co., of London, for the care they have exercised, at so great a distance, in printing its pages.

Calcutta: *March, 1903.*

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MINISTRY OF CULTURE · GOVERNMENT OF INDIA
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I. INTRODUCTION.

The completion of the *Flora of British India*, which for over a quarter of a century (1872–97) absorbed much of the attention of Sir Joseph Hooker, who has written the greater portion and edited the whole of that masterly work, marks the end of a period in the history of Indian Botany. In his preface to the seventh and last volume of the *Flora*, Sir Joseph describes it as "a pioneer work which, besides enabling botanists to name with some accuracy a host of Indian plants, may, I hope, serve two higher purposes: to facilitate the compilation of local Indian floras and monographs of large Indian genera; and to enable the phytographer to discuss the problems of the distribution of plants from the point of view of what is perhaps the richest and is certainly the most varied botanical area on the surface of the globe."

One period having ended, a new one must begin. The efforts of Indian botanists have for the past thirty years been largely devoted to the accumulation of material calculated to facilitate the preparation of the *Flora of British India;* they must now be directed to the compilation of smaller works, compact in form and concise in style, dealing with the vegetation of specific areas within that Indian Empire which is served by the *Flora*. This Empire, in the botanical sense, includes, besides those territories that are under the control of the Government of India, the Island of Ceylon, the Malayan Peninsula, and the Himalayan regions of Nepal and Bhutan.

A rather formidable difficulty, however, confronts those who would decide what the limits of the specific areas to be dealt with in such local Floras shall be. Putting aside for the moment the Malayan and the Indo-Chinese possessions of Britain, and neglecting the huge belt of hill-country which extends along the Himalayas from the Hindu Kush to the Mishmi and the Kachin ranges, we find within what is more precisely known as India a number of obvious and intelligible natural subdivisions. There is India Deserta—the dry and almost rainless area in Scinde, Rajputana, and the Panjab; there is India Diluvia, with its chief development in the Gangetic plain, comprising much of the territory that constitutes the North-West and the Lower Provinces; there is India Aquosa, the wet forest tract along the western Ghats from Guzerat to Travancore, which receives all the force of the south-west monsoon; there is India Vera, the dry but not desert triangle between the western and the eastern Ghats, with its apex in Tinivelly and its base along the Gangetic plain; there is India Subaquosa, the eastern Ghats and the strip between these and the sea; finally, there is India Littorea, most highly developed in the Sundribun area of the Gangetic delta. In each of these areas the type of vegetation that prevails is more or less dependent on the natural conditions there met with; this type is in consequence more or less distinctive. The obvious treatment is therefore to subdivide India into the regions thus roughly outlined, and to provide a compact local Flora for each. But it is evident enough, when further consideration is given to the subject, that, though plausible in theory, such a system of delimitation is neither wholly practicable nor altogether expedient. So far as India Deserta and India Aquosa are concerned, the areas are compact and the boundaries definite; it is, however, otherwise with India Diluvia and India Littorea. The vegetation characteristic of the Gangetic plain extends into the valley of the Brahmaputra, and though we may for the moment ignore, because the territory affected is Indo-Chinese, the fact that this flora recurs in the valley of the Irrawaday, we cannot forget that the same, or a very similar, vegetation appears in the alluvial tracts along Indian rivers other than the Ganges. Again, the mangrove forests at the mouths of the Ganges constitute no more than an outlying patch of a flora that characterises every sea-shore from the Mascarenes to Melanesia; this mangrove vegetation, though more extensively represented in the Sundribuns than elsewhere in India, is not more distinctive of the Gangetic delta than it is of similar tracts at the mouths of other considerable Indian rivers. Finally, the line of demarcation between India Subaquosa—the tracts along and below the eastern Ghats, and India Vera—the great peninsular

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table-land, is so much less clearly defined than the corresponding line between this table-land and the country along and below the western Ghats, that the two have to be dealt with as an organic whole. When so treated the two together form an area that, in its extent, is out of all proportion to any of the other subdivisions indicated.

If what has been said indicates that the adoption of natural areas is hardly practicable, it is easier still to show that this system of subdivision lacks convenience. Political exigencies and the accidents of history have led to an administrative partition of the empire and an ethnic distribution of its peoples by no means coincident with the natural characteristics of its provinces, as these are reflected in the vegetation. The theoretical advantage of dealing with even a compact natural area is thus usually overridden by a consideration for those whom a treatise like a local *Flora* is intended to benefit. The dweller in the Madras Presidency who would wish to study the Madras vegetation, must, if these natural areas be adopted, have at hand two works: one dealing with India Aquosa or, as an eminent Indian botanist has proposed to name it, Malabaria; and a second dealing with the conjoint India Subaquosa and India Vera, for which area the same authority has proposed the name Coromandelia. The inhabitant of the Bombay Presidency must possess both these works, and in addition that which treats of India Deserta. The district officer in the North-West Provinces, besides providing himself with a work dealing with the vegetation of the Gangetic plain, should have also at hand at least that which refers to Coromandelia. Finally, in the Lower Provinces, with which we are now more immediately concerned, anyone stationed in Chota Nagpur must use the volume on the plants of Coromandelia; anyone in Tirhut or Behar, that dealing with the Gangetic plain: anyone in Bengal itself, the last mentioned work, supplemented by one dealing with the Littoral vegetation of the Sundribuns; while an[illegible]e posted to Chittagong must consult a treatise dealing with [illegible] vegetation of Indo-China, whereof Chittagong forms geogra[illegible]ly, though not politically, an integral part. If the public [illegible]st is to be consulted, it is clear that a system of delim[illegible] other than the obviously natural one is essential in de[illegible] what are to be the limits of the areas treated in our India[illegible]loras; and the best system to adopt, because the most practicable, must be one that is based on a frank recognition of existing political frontiers, no matter how unscientific these may be. Now and again, however, it may be found possible, and indeed advisable, to effect a compromise, at least in matters of detail, between these political frontiers and the boundary lines indicated by the natural facts of distribution.

In the case of the Lower Provinces—for the use of whose inhabitants the present work is designed—a compromise of this kind seems particularly desirable. Here are included the plants of Bengal, Behar, and Tirhut, or those of the eastern half of the Gangetic plain, and those of the Sundribuns or the Gangetic delta. Besides these, however, the work includes not only the plants of Chota Nagpur and of Orissa, which are almost wholly characteristic of Coromandelia, but those of Tippera and Chittagong, which are Indo-Chinese rather than Indian. With the exception of a single district the work deals with the whole of the territories that go to form the Lieutenant-Governorship of Bengal, irrespective of the natural areas completely or partially included in its various provinces. The excluded district is that of Darjeeling, which, save as regards the submontane subdivision of Siliguri, is wholly Himalayan, and, from an elevation of 1500 feet upwards, possesses a flora that differs more essentially from the flora of every other district in the Lower Provinces than, among themselves, do those of any other two districts. To include in our Bengal list the plants of the Darjeeling district that are distinctly Himalayan would necessitate a larger volume, while the increase in bulk would confer no corresponding benefit on, indeed it might conceivably prove a hindrance to, some of those who are likely to use it. It seems preferable, therefore, to prepare a separate list of the plants of the Darjeeling district. If it be objected that the course now followed involves the exclusion from the Bengal list of the plants of the Sikkim Terai, which naturally forms part of the northern extension of the Bengal plain, the answer is that the corresponding area to the east of the River Tista, known as the Duars, is within the area here discussed, so that no species foun in any part of Bengal is likely to be omitted from the list. If it be further objected on the inclusion of the plants of the Terai and of the lower hills and valleys of Sikkim in a subsequent Darjeeling list will involve, *ipso facto*, the repetition of a considerable number of species already dealt with in the Bengal list, the answer is that this will ensure that no species shall drop out of both lists, a contingency that might easily occur in the case of any species found only on or near the arbitrary boundary line which must otherwise be drawn between the one area and the other.

When the question of boundary delimitation has been satisfactorily settled, the compiler of a local Flora finds himself face to face with a new and almost equally formidable difficulty. The collections on which the *Flora of British India* is based have been sufficiently extensive to permit of a general review of the vegetation of the Indian Empire, and are ample enough to allow of a special study of the characteristic features presented by the various natural subordinate areas. It is, however, found, when a definite tract is examined in detail, that we possess, as a rule, too limited a knowledge of its vegetation to admit of the compilation of a complete and reliable account of its flora. In the case of the Lower Provinces, while it may be assumed that our knowledge of the plants of the Gangetic Plain, and perhaps also of the Sundribuns, is fairly complete, and may even be taken for granted that, though we do not know all, we know the majority of the species of Behar, Chota Nagpur, and Chittagong, it is certain that our knowledge of the flora of Northern Tirhut and of that portion of North Bengal which constitutes the Duars leaves much to be desired, and that of the vegetation of the hilly portions of Tippera and Orissa we know no more than is necessary to enable us to appreciate our ignorance. The time for the preparation of a complete Local Flora of the Lower Provinces has not yet come; much special work is still called for in many of the more outlying districts. Yet something must be done, if the attention and interest of those capable of rendering the necessary assistance is to be invoked. What under the circumstances seems the best measure to adopt is to issue a provisional list or census of the plants within our area. This list is based on specimens or drawings preserved in the Calcutta Herbarium, supplemented in a few instances by a reference to species from Bengal, present in the collections at Kew, but not represented at Calcutta. Under each species reference is made to the provinces from which it has hitherto been reported. But since the provision of such a list goes a very short way towards assisting those inter-

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ested in the Bengal Flora, this information is supplemented by references to Roxburgh's *Flora Indica* and Hooker's *Flora of British India*, where descriptions of the majority of the species are to be found, and to Watt's *Dictionary of Economic Products*, where such of them as are useful are enumerated. Having regard, however, to the fact that the only one of these works, Roxburgh's *Flora Indica*, which can, by reason of its size, be conveniently used in the field, besides being the oldest, and on that account the least complete, does not cover the whole of the area under review, it has been considered advisable to provide, for field-use, definitions of the natural orders and genera to which our species belong, with a series of keys calculated to assist the student in referring any plant to its order and genus. Knowing, further, the difficulty often experienced by the beginner in using any "natural" system of classification, an attempt has been made, by the employment of the now generally discarded, but by no means therefore despicable, "artificial" sexual system, to provide an alternative route to his goal, the accurate determination of a genus. The genus having been ascertained, a further endeavour has been made, in all cases where a genus contains more than one species, to facilitate their determination by providing keys to all the species under the various genera. Beyond this it does not, for the moment, appear advisable to go. The assistance that it is hoped many of those who may use the present work shall be willing to give must be awaited before an attempt can be made to issue what should aim at being a complete Local Flora, giving succinct botanical descriptions of all the species that occur within the limits of the Lower Provinces and Chittagong.

The inclusion in this list of cultivated plants, exotic so far as the Lower Provinces are concerned, calls for some explanation. The selection—for it is not contended that every exotic species to be found in gardens in Bengal is here referred to—has been governed by the principle that it is advisable to include any species that is of economic interest, whether for its fruit, its seed, or its timber, or for the dye, tan, oil, fibre, or drug it may yield. As regards plants whose interest is purely æsthetic, it has, on the other hand, been deemed inadvisable to encumber the list with species that are to be found only in the gardens of European residents or in those of native noblemen and gentlemen of means and taste. An

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endeavour has therefore been made to limit the references to such species of this class as are commonly planted in village gardens, or are to be found in the neighbourhood of temples and shrines. The method adopted has, doubtless, sometimes led to the mention of species that, on the eclectic principle stated above, might have been omitted; and has in other cases failed in the direction of omitting species that might have been included. Errors of judgment of the former kind are, it is to be hoped, more numerous than those of the latter; in most cases where a question has arisen as to whether or not a particular plant deserved a place in the list, the species has been given the benefit of the doubt.

The area whose vegetation is dealt with in this census, including, as it does,—with the exception of the district of Darjeeling, or British Sikkim,—the provinces under the rule of the Lieutenant-Governor of Bengal, constitutes an irregularly oblong block, comprising the north-eastern portion of India proper, and lying between long. 84° and 93° E., lat. 22° and 27° N. The region is bounded throughout on its northern border by the lower spurs of the Himalayas. Its western boundaries are, approximately, the Gandak and the Son rivers, streams that find their way into the Ganges near the eighty-fifth meridian—the former from Nepal to the north, the latter from the highlands of Central India to the south. Its southern boundaries are, in the western half, approximately the river Mahanadi, which flows from Central India eastward to the Bay of Bengal; in the eastern half the Bay of Bengal itself. The eastern side is much more irregular; its boundaries are, in the northern third the river Brahmaputra; thereafter, more to the east as well as to the south, the river Megna; in the southern half and, still more to the east, the Lushai Hills, which are the northward prolongation of the Yomah of Arracan.

A line roughly coincident with the eighty-seventh meridian, naturally marked to the north of the Ganges by the river Kosi and to the south of the Ganges by the eastern base of the Chota Nagpur plateau, divides our area into two fairly equal halves: a western drier and an eastern moister half. This line is also roughly coincident with that which separates the area receiving under fifty inches of rain annually, from that which receives fifty inches or over. The country to the west of the line is that characterized by an annual turf as opposed to the perennial turf of the eastern half. In the western half the northern portion is occupied by the eastern extension of the Upper Gangetic plain, constituting to the north of the Ganges the province of Tirhut, to the south of that river the province of Behar. Immediately to the south of Behar rises the Chota Nagpur plateau, which forms the north-eastern portion of the table-land of Central India; south and south-east of Chota Nagpur lie the highlands of Orissa and the level country between these and the sea. The greater portion of the eastern half, from the eighty-seventh to the ninety-second meridian, is occupied by Bengal proper and the Sundribuns, or the Lower Gangetic Plain and the Gangetic Delta; between the ninety-second and ninety-third meridians, to the south of the twenty-sixth parallel and east of the Gangetic Delta, lie the hilly tracts of Tippera and Chittagong, which, though politically included in our area, belong geographically to Indo-China rather than to India.

The essential features of the area therefore are those of a great alluvial plain, with the lower spurs of the Himalayas and a strip of submontane forest along its northern border. The longer axis of the first or western half of this plain runs, like the river that dominates it, from west to east; that of its second or eastern half runs at right angles to its former course, from north to south. To the south of its upper or western half, and to the west of its lower or eastern half, this alluvial plain is again bounded by a fringe of submontane forest, above which rise the escarpments of the plateau of Chota Nagpur. The lower or eastern half of this alluvial plain extends towards the north-east into the valleys of the Surma and the Brahmaputra, and is bounded along the south-east border by the submontane forests, and the hilly tracts beyond them, of Tippera and Chittagong. The submontane forests to the north and to the south-west of this plain are characterized by the existence of gregarious tracts of *Sal*, unknown in the forests to the south-east; these latter forests are distinguished by the presence of *Gurjan*, unknown in the Subhimalayan forests, or in the submontane forests of Chota Nagpur.

The essential features of the vegetation in the area to the north of the Ganges, from the Gandak on the west to the Brahmaputra on the east, as we pass from north to south are as follows. First, a narrow, more or less sloping, gravelly submontane tract along the base of the Himalaya, covered, except along river-beds, with a

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dense forest, the constituent species of which are those that occur on the lower slopes of the mountains themselves. In existing river-beds only a few tough flexible bushes occur; along abandoned shingly river-courses the jungle is open and park-like, and the species are those characteristic of a drier climate than obtains in the forest alongside. This submontane forest is normally succeeded by a belt of swampy land of varying width, covered with long reedy grasses. Further out into the plain the ground as a rule rises somewhat, and, if so high as to be free from inundations, is in waste tracts usually covered with open jungle—of a bushy character in the western parts, taller and more park-like in the central districts, and mixed with reedy grass or sometimes consisting only of tall grass as we pass to the east. Much of this tract, however, especially in the west, is under cultivation, and is then bare or diversified with bamboos, palms, and orchards of mangoes, or, less often, groves of other trees; in and about the villages themselves the mangoes are often accompanied by a number of tree-weeds and semi-spontaneous more or less useful bushes and trees, that form characteristic village shrubberies. In the western parts of this area, where the population is very dense, these village shrubberies are sparingly represented; further east, the thickets thus formed become as a rule larger and denser; in places where a population has formerly existed, but has now disappeared, the species characteristic of these village shrubberies form dense and sometimes, as on the site of Gour, rather extensive forests.

Towards the west, the tracts liable to inundation are mainly confined to the banks of the larger rivers, and are there often covered with a jungle of reeds and bushes, largely Tamarisk, with a few trees. As we pass further east, however, the river-courses widen considerably in proportion to their streams, and their beds contain little or no vegetation. The powerful current in the rains sweeps everything away; the shingly or sandy banks are at other seasons too dry to admit of much growth. But old river-beds, marshes, lakes, and such streams as are stagnant or nearly so, except after heavy rains, are almost as completely covered with vegetation as is the land, while even small rivers with a gentle stream abound with water-plants. The south-eastern portion of North Bengal and that portion of Central Bengal to the east of the Bhagirati and the Hughli is of this character; while the same features are continued into Eastern Bengal, where they become exaggerated in the Jhils, a tract wholly under water during the rains, and only partially dry in the cold season. The marshes that in the cold weather stretch away from the river-banks, which stand a few feet above the mean level of the flooded country, are covered with rice. In the rains they form an almost unbroken inland sea of fresh water, dotted with islets of matted floating grasses. The banks themselves carry a fringing fence of brush-wood. As we pass southward from Central Bengal these features become equally exaggerated, but in a different manner, in the area of the Sundribuns within which the influence of the tides is felt. Here the whole is covered with a dense forest of those trees peculiar to mangrove swamps, and in its western half finally ends at the sea-face in a fence of the shrubs and climbers characteristic of all Indo-Malayan coasts. The eastern half of the Sundribun coast-line, where the tides are stronger and the distributaries of the conjoined Ganges and Brahmaputra discharge a greater volume of fresh water, consists of muddy river-banks and a muddy sea-face without vegetation. The north-eastern portion of this deltaic plain, before it passes into the salt-water marshes of the Sundribuns or the fresh-water marshes of the Jhils, is characterized by the presence of many low hills, islets of laterite rising slightly above the plain of alluvial soil, usually densely forest-clad; the trees at their bases mixed with tall grass, higher up their slopes tangled with heavy creepers.

Immediately to the south of the Ganges, from the Son eastward to the Bhagirati, the features met with north of the river continue unchanged, though the country as a whole is drier, the cultivation is less extensive, the bush-jungle more plentiful and closer, the groves of palms near villages larger. As we pass further south the country becomes diversified with numerous bare, low hills, and the intervening jungle becomes more park-like. The level or nearly level plain is much narrower than the corresponding tract to the north of the Ganges, and rapidly passes into a submontane forest altogether similar in character to, and largely identical in composition with, the corresponding tract at the foot of the Himalayas. This forest extends up the slopes that lead to the edge of the table-land of Chota Nagpur. Immediately to the west of the Bhagirati and the Hughli, in Western Bengal, we find, especially towards the south, an extension of the features that characterize Central Bengal. The strip of alluvial semi-aquatic rice-land is, however, comparatively narrow, and along the drier parts of West Bengal, from Burdwan to Midnapur up to the eastern edge of the Chota Nagpur plateau, we find repeated the features encountered between the Ganges and the northern slopes of that table-land. These characters are all continued southward into Orissa, where the low-lands are only an extension of Western Bengal, and the highlands are continuous with those of Chota Nagpur. Between the sea and the alluvial portion of Orissa, which is rather extensive, especially in the valley of the Mahanadi, we do not, however, experience that transition to a mangrove-swamp which characterizes Central Bengal, but meet instead, both to the north and again to the south of the Mahanadi delta, with a series of sand-dunes interposed between the rice-plain and the sea-face.

The inner highlands of Orissa are forest-clad like the ghats that lead up to their eastern edge; further west they become bare, or are only sparsely forest-clad. The same is true of the eastern edge of the Chota Nagpur plateau; the northern edge of that plateau and the table-land itself where not under cultivation are sparsely clad with a forest that, like the forests of Orissa, in appearance and largely in composition resembles those of Central India, rather than the forest met with in Northern Bengal. Some of the loftier peaks, both in Chota Nagpur and in Orissa, are sufficiently high to be more humid near the top than they are lower down, and therefore possess a few species characteristic of a nearly temperate moist climate.

The forest on the isolated hills already alluded to as characteristic of the northern portion of the alluvial area to the east of the Brahmaputra and the Megna, where they constitute the Madhopur jungles of Western Mymensingh, has altogether the appearance of, and in composition is largely identical with, the submontane forests of the Subhimalayan area and of the Chota Nagpur ghats, with, however, a decidedly larger proportion of such species as are to be found in Chota Nagpur, without occurring under the Himalayas, than it has of such species as are met with under the Himalayas, but not in Chota Nagpur. There are, however, present in these low hills an appreciable number of species that are not found in either of these areas, but that occur in the Garo Hills in Assam or in Tippera, which bounds the deltaic plain on the east, and in Chittagong, which continues, but on a more extensive scale, the features that characterize Tippera.

The provinces of Tippera and Chittagong are hilly throughout. The northern part of Tippera, where the hills are low, is largely covered with bamboo jungle. The southern portion is, like the higher part of Chittagong, covered with dense, often rather dry forest. The lower part of the Chittagong hills is often covered with brushwood. Between the outer hills themselves lie cultivated river-valleys, while between these hills and the sea is a narrow level strip of rice-land with, towards the north, a muddy sea-face, as in the adjacent eastern portion of the Sundribuns. More to the south a series of low flat islands skirt the coast, while the shores have the same mangrove vegetation and sea-fence as the western Sundribuns.

For the purposes of this work, the natural boundaries of the four western provinces, Tirhut, Behar, Chota Nagpur, and Orissa, have been left unchanged. As regards the first three, this treatment is as natural as it is convenient. Tirhut, lying from west to east between the Gandak and the Kosi, from north to south between the Subhimalayan forest and the Ganges; and Behar extending from the Son on the west to the old bed of the Bhagirati on the east, and lying from north to south between the Ganges and the ghats of Chota Nagpur, together form an integral portion of the Upper Gangetic plain. Chota Nagpur, immediately to the south of Behar, similarly constitutes a direct north-easterly extension of the highlands of Central India.

From one point of view it might have been advisable to deal with Tirhut and Behar together. It is, however, more convenient to separate them because Tirhut is wholly flat, whereas Behar is much diversified by hills, outliers from the flanks of the Chota Nagpur plateau. Behar, too, is appreciably drier than Tirhut, and these two circumstances, greater diversity of surface and less humidity, account for the presence in Behar of many species from Bandelkand, and some even from the Panjab, that are absent from Tirhut. Another and, though an accidental, not less important factor in influencing the vegetation of Tirhut is the density of the population. So close, in consequence, is the tilth, that throughout whole districts field is conterminous with field, and the cultivated land abuts so closely on wayside and watercourse as to leave no foothold for those species that form the roadside hedges and fill the weedy waste places so characteristic of Lower Bengal. Even the village shrubberies that constitute so marked a feature of much of our area, are in Tirhut conspicuous by their absence. The result is that, except for the water-plants in the smaller streams and sluggish rivers, the vegetation of Tirhut is chiefly limited to the crops with their concomitant field-weeds; even the latter are often conspicuous by their paucity. To this state of affairs is largely due the fact that our collections from South Tirhut are few and scanty. Of North Tirhut, where our province abuts on the submontane forest, here mostly within the Nepalese frontier, we know very little, the only collections of importance from the region being those of Buchanan-Hamilton, few of whose specimens are in India now, and more recently those of Hieronymus, the latter being altogether from Bettiah, the extreme north-west district of Tirhut. It is to be expected that, if carefully looked for, many of the plants characteristic of Gorakhpur, beyond the Gandak to the west, may yet be found in Tirhut. Behar, too, requires systematic re-exploration, for, though there are many Behar plants in the collections of Hamilton, Wallich, and Hooker, and especially in those of Kurz, much probably still remains to be collected. Chota Nagpur has received closer attention than Tirhut and Behar, large and valuable collections having been made there by Hooker, Thomson, Anderson, Kurz, Clarke, Gamble, and, especially, by Wood, Campbell, and Haines. But our knowledge of the Chota Nagpur flora is still far from adequate; much has yet to be done, particularly in the southern and south-western parts of the province.

Unlike the other western provinces, Orissa, in place of being a compact natural area, is an exceedingly composite one. The inner highlands form, like those of Chota Nagpur, a plateau with occasional higher hills, some of which actually reach subtemperate altitudes. The ghats that lead up to these highlands are continuous to the north with the eastern escarpments of Chota Nagpur, to the south with the Eastern Ghats—those "mountains of the Circars," from which, more than a century ago, Roxburgh obtained so many plants, of which he has left excellent drawings, that no one has seen since. The submontane strip below is continuous to the north with the drier part of West Bengal, which has a vegetation in appearance and composition like that of Behar. To the south this strip is continued as a belt below the Eastern Ghats that yielded many species to Russell, Koenig and Roxburgh, towards the end of the eighteenth century, of which even now we know little more than they have told us. The semi-aquatic rice-plain which stretches seaward from this submontane belt is in all essentials the same as the deltaic rice-swamp of Bengal, and the only really distinctive feature of Orissa, among the provinces with which this work deals, is the line of sand-dunes between the rice-plain and the sea. These sand-hills we have to thank for bringing within our area not a few of the littoral species characteristic of the Madras sea-coast.

Our botanical knowledge of this most varied and interesting province is almost blank. The chief collections at our disposal are some valuable ones made by Gamble, which are, however, only large enough to whet the appetite and to demonstrate our ignorance; fuller collections of Orissa sedges and grasses by Walsh; and small, but interesting collections of sea-shore plants by Alcock. As we know so little of this enticing region, it has seemed advisable to treat the province, as it is politically limited, as an organic whole. Perhaps it will be found convenient to do so always, rather than to attempt any natural subdivision. The only obvious alternative, so far as our present knowledge goes, is to annex the Orissa highlands to Chota Nagpur, and treat the lowlands as an integral portion of West Bengal.

If we now turn to the three eastern provinces, Chittagong, Tippera, and Bengal, it will be found that, while the existing boundaries of the two former may be left undisturbed, it is advisable for the purposes of this work to subject the last to considerable further subdivision. Just as Tirhut and Behar might have been considered together because both are integral portions of the Upper Gangetic plain, so might Chittagong and Tippera be treated as one because both are integral portions of the western, or Assam-Arracan, subdivision of Indo-China. The two are, however, naturally well delimited by the valley of the river Feni, and, if for no other reason, their separation is convenient because our knowledge of their flora is so disproportionate. Our acquaintance with the vegetation of Chittagong is based on the work of Roxburgh, Wallich's collector Bruce, Hooker and Thomson, Clarke, Wood, and especially Lister and the native collectors of the Calcutta Garden supervised by Dowling. The knowledge thus obtained, though doubtless far from complete, is nevertheless respectable.. The vegetation of Chittagong may be said to be mainly that characteristic of Arracan, with, however, as might be expected, a considerable admixture of species characteristic of Cachar and Khasia, and with not a few special forms.

Of Tippera we know even less than we do of Orissa. What we do know of the level and the submontane north-western portion we mainly owe to Clarke. Taken by themselves, these lower tracts might be considered no more than a portion of Eastern Bengal, with an unusual admixture of species characteristic of Silhet. But this Silhet element in the flora is sufficiently strong to make it convenient to deal with this tract, the Comilla district, apart from Bengal, and to treat it in connection with its own highlands. As regards these highlands, we know little beyond what is to be learned from the work of Roxburgh and of Buchanan-Hamilton, done eighty to a hundred years ago. Hamilton, indeed, appears to be the only botanist who has explored the hills of "Southern Tripura." Few of Hamilton's specimens, and none of his Tippera ones, are now in India. Roxburgh's specimens, too, are gone, but fortunately India has not been robbed of his drawings, a number of which represent interesting and, but for these drawings, still unknown plants from Hill Tippera. What we do know of the vegetation of these Tippera hills indicates that in the northern parts it is an extension of the flora characteristic of the Bhuban and other ranges of hills in Cachar and South Silhet, outliers of the Lushai range; in the southern parts the flora is a repetition, with variations, of the vegetation of Chittagong.

The Lower Gangetic Plain, or Bengal proper, which from the uniformity of its configuration might be expected to exhibit a corresponding uniformity of vegetation, possesses in reality elements so discordant as to demand further subdivision. Fortunately, when examined in detail, the area is found to lend itself naturally to our purpose. That portion of the Gangetic delta nearest to the sea, an intricate system of sea-creeks and half-formed islands, densely clothed with a tidal forest of a purely Malayan type, separates itself spontaneously from the alluvial rice-plain to the north, where the river-banks at least are higher, where tanks can be dug that will retain fresh-water, and where only the larger streams are much affected by the tides. This dense forest forms the compact and natural Sundribun province, filled with species to be met nowhere else in our area save along the southern coast of Chittagong and, to a minor degree, in the delta of the Mahanadi. Our knowledge of the Sundribun flora we owe to many collectors; Roxburgh, Wallich, Hooker, Thomson, Anderson, Kurz, Gamble, Clarke, have all penetrated the tract. It is, however, to Heinig that we are chiefly indebted for the more complete exploration of this most interesting region; his collections, assiduously and carefully made during a succession of seasons, have converted what ten years ago was one of the least known portions of Bengal into a tract almost as thoroughly investigated as the rice-plain itself.

Scarcely less necessary and natural is the separation of Eastern Bengal, the country between the Brahmaputra and Tippera, from the rest of the Lower Gangetic plain. The alluvial rice-swamp here is no doubt only the eastward extension of the plain of Central Bengal; but there are two dominant and, as it happens, very discordant features in the vegetation of the tract that render its separate treatment essential. One of these features is the vegetation of the Jhils, those inland sheets of fresh-water that are as characteristic of the southern portion of East Bengal as their salt-marshes and tidal creeks are of the Sundribuns. The other is supplied by the curious and distinctive vegetation of the laterite islets that crop through the alluvium in the Mymensingh district of the Dacca division. Our acquaintance with the flora of the Jhils is derived from the labours of Roxburgh, Griffith, Hooker, Clarke, and others; what we know of the Madhopur jungles in Mymensingh we owe entirely to Clarke. Much has yet to be done towards completely investigating these Mymensingh jungles, which in many ways are the most interesting feature of the Lower Gangetic Plain.

Useful, too, is the recognition apart of North Bengal—the country that lies from west to east between the Kosi and the Brahmaputra, from south to north between the Ganges and the lower spurs of the Himalaya. Towards the south and south-east, no doubt, this province repeats the essential features of the alluvial plain of Central and Eastern Bengal, while further to the north it is no more than an eastward continuation of the features exhibited by Tirhut. Even here, however, amid much agreement there is great dissimilarity; we are now in a land where the turf is uniformly perennial, a circumstance that carries with it more than lies on the surface. The northern portion includes the submontane forest belt; in this respect North Bengal accidentally differs from Tirhut, since along the northern border of that province this forest lies largely within the Nepalese frontier, and so is removed politically from the area with which we have to deal. It is this Subhimalayan forest which supplies the feature that necessitates the separation of North Bengal from the rest of the Lower Gangetic Plain. Our knowledge of the flora of North Bengal, as regards the central portions, we owe chiefly to Kurz, King, and Clarke; the most westerly district, Purnea, has been well explored only by Buchanan-Hamilton, few of whose specimens, unfortunately, are available in India. The submontane forest has been explored by Anderson, King, Kurz, Clarke, and Gamble, but the attention of all save the last-named botanist, and indeed his also in the main, has been directed to the Terai, which, for reasons already set forth, it has been necessary to exclude from the scope of this work. The Duars, which are merely an eastward extension across the Tista of the same forest belt, have been, however, partially explored by Gamble, and more fully examined by Heawood and by Haines, to whose exertions our knowledge of the region is chiefly due. Much, however, yet remains to be done both in the Duars and in Cooch Behar.

Central Bengal, the tract to the south and west of the Ganges and Brahmaputra, lying north of the Sundribuns and east of the Bhagirati and Hughli, possesses, as compared with the three Bengal tracts already discussed, the negative feature of being typically representative of the alluvial deltaic rice-plain and nothing more. Except that along the banks of its main streams, so far as these are at all affected by the tides, we find, as a narrow hedge or in scattered patches, some species characteristic of the Sundribuns, and that all abandoned river-beds and ponds are covered with water-plants, the whole country is a semi-aquatic rice-plain. The mounds and embankments thrown up here and there throughout the area are, where not occupied by houses or by roadways, thickly covered with the species characteristic of Bengal village shrubberies. Of this tract, as of the Sundribuns, we possess a knowledge that is probably practically complete. Little or nothing has been left by Roxburgh and Carey for succeeding generations of botanists to add; indeed, these careful collectors have left us not a few records of species, found by them in Central Bengal, that no one has met with since.

The remaining portion of Bengal proper stretches westward from the Bhagirati and the Hughli to the eastern base of the Chota Nagpur ghats. Quite narrow at its northern extremity, this province of West Bengal widens gradually southward to where it passes with hardly a break into the lowlands of Orissa. Along its eastern edge it forms a rather narrow belt of deltaic alluvium, with all the features characterising Central Bengal. West of this belt lies a non-alluvial plain, possessing many of the features of Behar, and passing gradually into the submontane forests below the eastern ghats of Chota Nagpur, with all the transitions encountered as we pass southward through Behar to the northern edge of the same table-land. We owe to many collectors, but more than any others to Kurz and Ball, our fairly adequate knowledge of the northern half of this non-alluvial tract. The most interesting feature in its flora is perhaps the fact that here we find, growing side by side, a few species characteristic of the Panjab and Rajputana that have managed to find their way through Bandelkand and Behar thus far to the east; and a few, equally characteristic of Coromandel and the Circars, that have succeeded in spreading, through the lowlands of Orissa and Midnapur, thus far to the north. One of the most interesting members of the latter category is, perhaps, the intrinsically insignificant monotypic genus *Sphæromorphæa.* Our acquaintance with the southern portion of this tract is of the slightest; but for some references by Roxburgh to interesting species from the "Midnapur jungles," it would be altogether blank. Having regard to the composite nature of West Bengal as a botanical province, and to the fact that its alluvial rice-plain is neither very extensive nor at all distinctive, the province has not been cited in the list under any species that belongs to West Bengal merely because it occurs in these rice-fields. Whenever, therefore, a plant is cited as occurring in West Bengal, it is to be understood that it has been collected, to the west of the narrow semi-aquatic rice-plain, in the non-alluvial portion of the province.

The artificial sexual system of classification, of which a subsidiary use is here made as an alternative aid in the determination of the genera, is employed, so far as it is used at all, in an absolute fashion. The conventions that accompany its employment in botanical works of the early portion of last century have been put aside. In these treatises, as here, the primary subdivision is dependent on the number of stamens in the flower. In many obviously natural genera, however, and for that matter in not a few species, the number of stamens is variable. Sometimes this variation in number is the result of what we may term a natural accident, as where, among the smaller and definite numbers, the uniseriate stamens in the flowers of the same plant are found to run from 3–5, 7–10, and the like. More often the variation has an obvious structural explanation, as where the stamens in a species may be 4 or 8, or 5, 10, or 15, according to whether only one, or more than one series of stamens becomes developed. This type of variation, occasional in species, is much more frequent within the limits of a genus, where, too, another type of variation, rare in individual species, is not uncommon. This is the type that leads to the number of stamens being 4 or 5, 8 or 10, and the like; one species and often a whole section of a genus having tetramerous flowers, while another type and section may have the flowers pentamerous.

In works where the artificial system is the only one employed—Roxburgh's *Flora Indica*, of which those who are likely to use this work will probably become possessed, is an excellent example of the class—that system had to be used not only as a means of identification, but as the basis of an arrangement. The incompatability of these two objects is sufficiently obvious. No system of arrangement could be satisfactory that resulted in the treatment of the same natural genus in more places than one. A decision had therefore to be arrived at, in cases where a genus includes some species with 4 stamens and others with 5, whether the genus as a whole should be placed in the class Tetrandria or the class Pentandria. But whatever in the compromises thus called for made for efficiency in the arrangement of the genera, correspondingly detracted from the system as an instrument for the determination of their species. Here we are hampered by no such necessity; the basis of our arrangement is derived from an independent source—the *Genera Plantarum* of Bentham and Hooker adopted

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in the *Flora of British India.* We are therefore at liberty to make fuller use of the artificial system than our predecessors could as an aid to identification. In this work, therefore, if, as sometimes happens, a genus contains species with 4 or 5, or 8 or 10 stamens, it will be found to have been included under all the four classes—*Tetrandria*, *Pentandria*, *Octandria*, *Decandria*—to which an examination of any individual flower may naturally invite a reference.

The secondary subdivision into orders, in treatises like the *Flora Indica*, is based on the number of free carpels, or at any rate free styles, in the flower. We have, however, our own "natural" orders, as limited in the *Flora of British India.* To deal with another series of orders would only tend to confusion, and the character on which these artificial ones are based is only casually made use of in the keys provided for the genera under the various artificial classes. Moreover, one of the classes, the *Polygamia*, which forms the twenty-third class of the artificial system of Linnæus, and includes such plants as possess both hermaphrodite and unisexual flowers, has been distributed. All the species—and consequently their genera—that possess *any* hermaphrodite flowers will be met with under the classes to which, from the nature of these hermaphrodite flowers, it is found that they are referable.

The last of the Linnean classes, the twenty-fourth, is not given completely, our attention being entirely confined to the Pteridophyta or Vascular Cryptogams, comprising the Ferns and the Fern-Allies. The arrangement and nomenclature adopted for these plants is that used in Hooker and Baker's *Synopsis*, and in Baker's *Fern-Allies*, while for the Ferns themselves references are given to the admirable *Handbook of the Ferns of British India and Ceylon* by Beddome.

The following are the abbreviations used:—

F. I.—Roxburgh's *Flora Indica.*

F. B. I.—Hooker's *Flora of British India.*

E. D.—Watt's *Dictionary of the Economic Products of India.*

F. I. C.—Beddome's *Ferns of British India and Ceylon.*

As regards Roxburgh and Hooker, the references are to volume and page. As regards Watt's great work, the references are to the letter, and to the register number of the particular plant or product. In the case of Beddome, whose work is in one volume, the references are to the pages.

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II. ARTIFICIAL GUIDE TO THE GENERA.

- ‡Plants with conspicuous flowers (PHANEROGAMIA) :—[p. 22]
  - †Stamens and pistils in the same flower :—[p. 22]
    - Male and female organs distinct :—
      - Stamens not united either above or below :—
        - Stamens of equal or nearly equal length :—
          - Stamens solitary.......................................I. **MONANDRIA.**
          - Stamens 2 ....II. **DIANDRIA.**
          - Stamens 3 ....III. **TRIANDRIA.**
          - Stamens 4 ....IV. **TETRANDRIA.**
          - Stamens 5 ....V. **PENTANDRIA.**
          - Stamens 6 equal, or if unequal then 3 long and 3 short VI. **HEXANDRIA.**
          - Stamens 7...VII. **HEPTANDRIA.**
          - Stamens 8 ....VIII. **OCTANDRIA.**
          - Stamens 9 ....IX. **ENNEANDRIA.**
          - Stamens 10 or 11 ....X. **DECANDRIA.**
          - Stamens 12 or any number between 12 and 19 XI. **DODECANDRIA.**
          - Stamens 20 or more than 20 :—
            - Filaments attached to calyx ....XII. **ICOSANDRIA.**
            - Filaments not attached to calyx ......XIII. **POLYANDRIA.**
        - Stamens of markedly unequal length :—
          - Stamens 2 long and 2 short..................XIV. **DIDYNAMIA.**
          - Stamens 4 long and 2 short............XV. **TETRADYNAMIA.**
      - Stamens united :—
        - Union of stamens occurring in the filaments :—
          - Stamens in one phalanx or bundle...XVI. **MONADELPHIA.**
          - Stamens in two phalanges ....XVII. **DIADELPHIA.**
          - Stamens in three or more plalanges XVIII. **POLYADELPHIA.**
        - Union of stamens confined to anthers......XIX. **SYNGENESIA.**
    - Male organs attached to and standing upon the female XX. **GYNANDRIA.**

†Stamens and pistils in different flowers :—[p. 21]
  Male and female flowers not mixed with hermaphrodite flowers :—
    Male and female flowers on the same plant......XXI. **MONŒCIA.**
    Male and female flowers on different plants ......XXII. **DIŒCIA.**
  Male and female flowers mixed with hermaphrodite flowers, the unisexual flowers sometimes on the same, sometimes on different plants ....* XXIII. **POLYGAMIA.**
‡Plants without proper flowers [p. 21] ....XXIV. **CRYPTOGAMIA.**

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* The *Polygamia* are sometimes further subdivided according as the flowers are polygamo-monœcious or polygamo-diœcious. It is not a very useful class, and is here distributed among the various other classes from I. to XX.

Genera that in the following pages are distinguished by an asterisk—*e.g.*, 106*. **Kleinhovia**—will not be found in the body of the work, but are defined in the APPENDIX.

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Class I. MONANDRIA.

*Perianth double :—[p. 24]
Leaves opposite, herbs :—
Stigma subcapitate, hardly lobed ....598. **Hoppea.**
Stigmas 2, distinct at the apex of a linear style ......599. **Canscora.**
Leaves alternate :—
Leaves 2-lobed ; woody shrubs ; fruit a legume ......279. **Bauhinia.**
Leaves entire :—
Trees ; leaves without a leaf-sheath and with distinct reticulate secondary venation ; fruit a drupe ....203. **Mangifera.**
Herbs, rarely shrubs ; leaves with large clasping leaf-sheath, and with many parallel nerves passing horizontally or obliquely from a midrib but without reticulate secondary venation ; fruit neither a legume nor a drupe :—
†Anther 2-celled ; calyx tubular or spathaceous ; style slender, embraced below the stigma by the anther ; placentas many-ovuled ; embryo central, straight :—[p. 24]
Ovary 1-celled ; placentas 3 parietal ; corolla-tube long ; stigma turbinate :—
Scape leafless ; flowers lilac ....929. **Mantisia.**
Stem leafy ; flowers yellow ....930. **Globba.**
Ovary 3-celled ; placentas axial :—
Lateral staminodes broad :—
Connective not spurred at the base ; corolla-tube long, slender :—
Filament short :—
Connective broad, crested ; stigma turbinate
931. **Kæmpferia.**
Connective not crested ; stigma subglobose
932. **Gastrochilus.**
Filament long, narrow ; connective very narrow, not crested ; stigma subglobose ....933. **Hedychium.**
Connective spurred at the base ; corolla-tube funnel-shaped ; stigma 2-lipped, the lips ciliate ; bracts forming a cone-like spike ....934. **Curcuma.**
Lateral staminodes small or 0, rarely narrow and adnate to the lip ; corolla-tube cylindric :—
‡Flowers in dense cone-like spikes :—[p. 24]
Anther-cells divaricate on a short arcuate filament with or without a petaloid crest ; stigma small subglobose,

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or larger and gibbous behind; spikes almost always rising direct from rhizome, rarely at apex of a leafy stem ....935. **Amomum.**

Anther-cells contiguous, parallel :—

Filament short, connective produced as a narrow appendage as long as the anther; stigma small, subglobose; spikes usually produced direct from the rhizome, sometimes at apex of a leafy stem 936. **Zingiber.**

Filament forming with the produced connective an oblong petaloid process with the contiguous linear anther-cells placed in its middle; stigma with a semilunar pit ciliate round the margin; spikes usually at apex of leafy stem, rarely rising direct from the rhizome ....937. **Costus.**

‡Flowers in racemes or panicles at the top of leafy stems; filament long, anther-cells divergent at apex; stigma subglobose [p. 23] ....938. **Alpinia.**

†Anther 1-celled, laterally adnate to a petaloid filament; calyx of free sepals :—[p. 23]

Staminal tube with 5 subsimilar slightly unequal petaloid segments, the 1-celled anther adnate to one of the smaller segments; ovary 3-celled; placentas many-ovuled; style flattened, stigma terminal, capitate; embryo straight 939. **Canna.**

Staminal tube very irregular, 5–6-lobed, 1 or 2 lobes lateral and 1 (the lip) anterior, with 2 or 3 lobes dorsal of which 2 or 1 are hood-like and another bears the anther-cell; placentas 1-ovuled; stigma oblique, dilated or 2-labiate; embryo curved :—

Ovary in appearance 1-celled and 1-ovuled with 2 small rudimentary empty cells; stem leafy with a terminal few-flowered inflorescence and convolute sheathing bracts 940. **Maranta.**

Ovary 3-celled, 3-ovuled :—

Stem leafy with terminal panicled scattered flowers; panicle with convolute deciduous sheathing bracts at the forks, and deciduous bracteoles ....941. **Clinogyne.**

Stem with broad solitary leaves and lateral clustered heads of flowers; bracts and bracteoles persistent 942. **Phrynium.**

*Perianth single, or obsolete or absent :—[p. 23]

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Flowers with distinct gamophyllous perianth; stems herbaceous with opposite leaves and no leaf-sheath, or fleshy jointed and leafless:—

Leaves distinct, opposite; stems herbaceous; style simple 763. **Boerhaavia.**

Leaves 0; stems fleshy; styles 2 or more:—

Flowers in the axils of scales of a stoutish cone; seeds albuminous, embryo curved ....783. **Arthrocnemum.**

Flowers sunk in cavities of the joints of a slender cone; seeds without albumen, embryo conduplicate ....784. **Salicornia.**

Flowers with perianth reduced to lodicules or bristles in the axils of the glumes of spikelets, or 0; stems grassy, usually leafy at least at base; leaves alternate with distinct leaf-sheath, sometimes the sheath alone present:—

†Flower in axil of a glume only; leaves 3-stichous, rarely 0, sheaths closed in front; fruit a nut with seed free inside; embryo within the albumen; style simple with 2–3 stigmas:—[p. 26]

Intermediate hermaphrodite glumes few, not more numerous than the 2 or more lowest empty; perianth of 6 hypogynous bristles 1030. **Rynchospora.**

Intermediate hermaphrodite glumes usually many, always more numerous than the 1–2 lowest empty:—

Flowering glumes arranged distichously; perianth absent:—

Rachilla of spikelet deciduous ....1032. **Kyllinga.**

Rachilla of spikelet persistent:—

Fruit laterally compressed ....1033. **Pycreus.**

Fruit dorsally compressed ....1034. **Juncellus.**

Flowering glumes arranged spirally:—

Base of style constricted or articulate above the fruit:—

Stem leafless; perianth represented by hypogynous bristles 1038. **Eleocharis.**

Stem leafy below; perianth 0:—

Style base persisting, or if deciduous not leaving a tumour on the fruit:—

Glumes separable from the rachilla 1039. **Fimbristylis.**

Glumes persistent on the rachilla 1040. **Echinolytrum.**

Style base deciduous, leaving a tumour on the fruit 1041. **Bulbostylis.**

Base of style passing gradually into the fruit:—

Perianth of 2 hyaline antero-posterior entire hypogynous scales ....1042. **Lipocarpha.**

Perianth 0 or of 1–7 setaceous divided or entire hypogynous scales, when 2 not antero-posterior:—

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Hypogynous scales 6, divided to the base into linear segments ....1043. **Eriophorum.**

Hypogynous scales 1–7, undivided, or 0...1045. **Scirpus.**

†Flower interposed between a glume and a palea; leaves 2-stichous, sheaths open in front and ligulate at apex behind; fruit a grain with seed adherent to pericarp; embryo outside albumen at base; styles 2, distinct, very rarely connate below :—[p. 25]

Spikelets articulate on their pedicels or deciduous with them :—

Spikelets all similar; styles connate below ...1065. **Imperata.**

Spikelets dissimilar; styles free :—

Glume III of sessile spikelet male ......1076. **Pogonatherum.**

Glume III of sessile spikelet neuter or 0...1080. **Andropogon.**

Spikelets continuous with their pedicels and persistent on them; styles free :—

Spikelets 1-flowered ....1088. **Polypogon.**

Spikelets 2- or more-flowered :—

Spikelets minute, in globose clusters on an elongated simple rachis..1097. **Elytrophorus.**

Spikelets conspicuous :—

Spikelets penicillate with long silky hairs, in large panicles 1099. **Phragmites.**

Spikelets not penicillate with silky hairs, in loose panicles or spikes ....1101. **Eragrostis.**

Class II. DIANDRIA.

Carpels and styles 4, carpels free; small submerged aquatic plants of brackish ponds and marshes, with narrow grassy leaves...1021. **Ruppia.**

Carpels solitary, or if 2 or more, connate; style simple with 1–3 stigmas, or if styles free not more than 2 :—

*Leaves sheathing at the base or occasionally reduced to sheaths; nerves parallel with no reticulate venation :—[p. 28]

†Perianth reduced to small scales or bristles, or absent :—[p. 28]

‡Flowers interposed between a glume and a palea; leaves distichous, sheaths open in front and ligulate at apex behind; fruit a grain with embryo outside the albumen; styles 2, free or rarely connate below :—[p. 27]

§Spikelets articulate on their pedicels or deciduous with them :—[p. 27]

¶Rachis of inflorescence inarticulate; styles free :—[p. 27]

Spikelets very many, minute, densely crowded on the capillary branches of a large panicle [p. 27] 1050. **Thysanolæna.

Spikelets secund on a slender flattened or filiform rachis [p. 26] ....1064. **Dimeria.

¶Rachis of inflorescence articulate:—[p. 26]

Spikelets all similar:—

Racemes of spikelets in compound spiciform panicles; styles connate at base........................1065. **Imperata.**

Racemes of spikelets 2-nate, digitate, or approximate on a short main axis; styles free...............1068. **Pollinia.**

Spikelets dissimilar:—

Lower floret of sessile spikelet male:—

Spikelets all awned; styles free:—

Spikelets 2-awned ....1076. **Pogonatherum.**

Spikelets 1-awned:—

Leaves lanceolate; spikelets 2-flowered 1077. **Apocopis.**

Leaves cordate at base; spikelets 1-flowered 1078. **Arthraxon.**

Spikelets 2-nate, only the upper one awned; styles connate below ....1079. **Lophopogon.**

Lower floret of all the spikelets empty 1080. **Andropogon.**

§Spikelets continuous with their pedicels and persistent on them; styles free:—[p. 26]

Leaf-blade transversely trabeculately veined between the parallel nerves ....1096. **Centotheca.**

Leaf-blade without any transverse venation:—

Spikelets 1-flowered:—

Glumes I and II firm, awned ....1088. **Polypogon.**

Glumes I and II membranous, not awned 1090. **Sporobolus.**

Spikelets 2- or more-flowered:—

Spikelets minute, in globose clusters on a long simple rachis ....1097. **Elytrophorus.**

Spikelets conspicuous:—

Spikelets penicillate with long silky hairs, panicled 1099. **Phragmites.**

Spikelets not penicillate, loosely panicled or spicate 1101. **Eragrostis.**

‡Flowers in the axil of a glume only; leaves 3-stichous, or only basal, sometimes 0, sheaths closed in front; fruit a minute nut with embryo inside the albumen; style simple with 2–3 stigmas:—[p. 26]

Intermediate hermaphrodite glumes few, not more numerous than the 2 or more lowest empty :—

Style 2-fid ; perianth of 6 hypogynous bristles 1030. **Rynchospora.**

Style 3-fid ; perianth 0 ....1031. **Cladium.**

Intermediate hermaphrodite glumes usually many, always more numerous than the 1–2 lowest empty :—

Flowering glumes distichous ; perianth 0 :—

Rachilla of spikelet deciduous..................1032. **Kyllinga.**

Rachilla of spikelet persistent :—

Fruit distinctly compressed :—

Fruit laterally compressed..................1033. **Pycreus.**

Fruit dorsally compressed ....1034. **Juncellus.**

Fruit trigonous ....1035. **Cyperus.**

Flowering glumes spirally arranged :—

Base of style constricted or articulate above the fruit :—

Stem leafless ; perianth of bristles......1038. **Eleocharis.**

Stem leafy below ; perianth 0 :—

Style-base persisting, or if deciduous not leaving a tumour on the fruit :—

Glumes separable from the rachilla 1039. **Fimbristylis.**

Glumes persistent on the rachilla 1040. **Echinolytrum.**

Style-base deciduous, leaving a tumour on the fruit 1041. **Bulbostylis.**

Base of style passing gradually into the fruit ; perianth usually of scales or bristles :—

Hypogynous scales 6, divided to the base into linear segments ....1043. **Eriophorum.**

Hypogynous scales, if present, undivided :—

Leaves hairy ; hypogynous scales 6, or 3, or 0 1044. **Fuirena.**

Leaves glabrous ; hypogynous scales 7–1, or 0 1045. **Scirpus.**

†Perianth conspicuous, in two whorls of 3 each :—[p. 26]

Perianth segments in two dissimilar whorls ; staminodes 4 ; leaves thin ....976. **Aneilema.**

Perianth segments all similar, corolline ; staminode 1 ; leaves rigid..928. **Apostasia.**

*Leaves not sheathing at the base ; lamina pinnately nerved, rarely parallel-nerved but then with reticulate secondary venation, occasionally, when submerged, multifid :—[p. 26]

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Perianth 0; small membranous or fleshy herbs with minute flowers in slender simple spikes; leaves opposite or whorled 792. **Peperomia.**

Perianth of 2 distinct whorls, sepals and petals always present:—

Petals free:—

Leaves alternate:—

Herbs; sepals and petals each 4; leaves simple, lobed 39. **Nasturtium.**

Trees or shrubs; sepals 5 or more and petals 5; leaves simple or compound odd-pinnate:—

Fruit a small, obliquely subglobose drupe; leaves simple or compound ....201. **Meliosma.**

Fruit of 1–5 linear-oblong, membranous samaras; leaves compound ....148. **Ailanthus.**

Leaves opposite:—

Shrubs; petals inserted within the calyx and outside the flat disk; fruit rather large, fleshy ....182. **Salacia.**

Herbs; petals inserted at the mouth of the calyx-tube on the edge of the cupular disk; fruit very small, dry 342. **Ammannia.**

Petals connate in a gamophyllous corolla:—

†Corolla regular; stamens alternate with carpels, facing each other at opposite sides of the flower, never accompanied by staminodes; leaves opposite:—[p. 30]

Corolla-lobes imbricate:—

Climbing shrubs with berry-like fruits; leaves compound or simple ....531. **Jasminum.**

Erect trees with dry capsular fruits:—

Leaves simple, fruit a compressed leathery capsule 532. **Nyctanthes.**

Leaves compound, odd-pinnate; fruit an obovoid woody capsule ....533. **Schrebera.**

Corolla-lobes valvate; leaves simple:—

Erect trees or shrubs, with thinnish leaves pinnately nerved:—

Flowers in axillary panicles or cymes; corolla-tube very short so that its lobes form often almost free petals, or petals connate in two pairs ....534. **Linociera.**

Flowers in terminal panicles; corolla-tube always obvious 536. **Ligustrum.**

Climbing shrubs, with thick leathery leaves strongly 3-nerved from the base ....537. **Myxopyrum.**

†Corolla irregular, often markedly so; even when only somewhat oblique, the stamens not alternate with carpels but with corolla-lobes and obviously either a posterior or, less frequently, an anterior pair, and occasionally accompanied by 2, sometimes even by 3 staminodes :—[p. 29]

Corolla spurred, distinctly 2-lipped, the stamens alternate with lobes of lower lip; ovary 1-celled; herbs of wet places or ponds with radical rosulate sometimes obsolete leaves, or with submerged capillary multifid leaves ....671. **Utricularia.**

Corolla not spurred :—

Stamens towards the upper side of flower, representing a perfect posterior pair; ovary 2-celled; leaves opposite :—

Corolla subrotate, lobes 4, one rather larger; stamens at sides of uppermost lobe, staminodes 0...663. **Veronica.**

Corolla distinctly 2-lipped; staminodes 2, representing an imperfect anterior pair of stamens :—

Stamens and staminodes both inserted within the corolla-tube and included...............654. **Dopatrium.**

Stamens only inserted within the tube, staminodes adnate to corolla-throat, both exserted :—

Calyx 5-partite, lobes all narrow :—

Leaves with main-veins more or less parallel from base; staminodes unequally 2-lobed; capsule short 657. **Ilysanthes.**

Leaves with main-veins pinnate; staminodes entire; capsule long ....658. **Bonnaya.**

Calyx 4-partite, upper and lower lobes large, lateral narrow ....659. **Curanga.**

Stamens towards the lower side of the flower or at least not obviously representing a posterior pair :—

Small prostrate diffuse or creeping herbs, with opposite or fascicled leaves never exceeding ·25 in. long and with very minute flowers ·07–·05 in. long :—

Calyx tubular 5-angled, shortly acutely 5-fid 660. **Microcarpæa.**

Calyx campanulate, with 3–4 short obtuse lobes 661. **Glossostigma.**

Herbs or shrubs, with conspicuous leaves and usually conspicuous flowers; leaves never under ·5 in. long :—

Ovules in each cell of the ovary or on each placenta more than 2, or if only 2 then placed one above the other; anthers 2-celled :—

- Anther-cells divergent; posterior stamens almost always represented by staminodes :—
  - Anther-cells confluent at apex; ovary 1-celled, sometimes obscurely so :—
    - Leaves several alternate; capsule ellipsoid, included in the calyx...675. **Rhynchoglossum.**
    - Leaves opposite or whorled or leaf solitary; capsule much longer than calyx :—
      - Flowers subsessile in dense subcapitate cymes; stem leafless or scaly below, with 4 leaves in a whorl at the apex ....674. **Tetraphyllum.**
      - Flowers pedicelled on axillary peduncles :—
        - Stigma oblique; leaf solitary or leaves opposite ....672. **Didymocarpus.**
        - Stigma shortly 2-fid; leaves opposite 673. **Chirita.**
  - Anther-cells not confluent; leaves opposite :—
    - Ovary 1-celled, the ovules attached under the laminæ of a projecting parietal 2-laminate placenta ....685. **Martynia.**
    - Ovary 2-celled, the ovules attached to an inconspicuous placenta on the middle of the septum 689. **Nelsonia.**
- Anther-cells parallel or one placed higher up than the other :—
  - Leaves alternate crowded, subradical; seeds not supported on rigid retinacula ......688. **Elytraria.**
  - Leaves opposite :—
    - ¶Seeds supported on hard retinacula :—[p. 32]
      - Corolla-lobes twisted to the left in bud 701. **Dædalacanthus.**
      - Corolla-lobes imbricated in bud :—
        - ‡Ovules 3–10 in each cell; capsule normally 6- or more-seeded :—[p. 32]
          - Capsule compressed at right angles to the septum; seeds ovoid, hardly compressed 703. **Andrographis.**
          - Capsule subterete; seeds much compressed :—
            - §Corolla-tube narrowly cylindric, slender, straight; ovary pubescent [p. 32] ....704. **Gymnostachyum.**

§Corolla-tube funnel-shaped, curved; ovary glabrous [p. 31]
705. **Phlogacanthus.**

‡Ovules 2, rarely 1, in each cell :—[p. 31]

Corolla-lobes 5, subequal :—

Sepals 4, two opposite outer larger than the others ....707. **Barleria.**

Sepals 5, subequal, all small :—

Corolla-tube long, slender
709. **Eranthemum.**

Corolla-tube short, limb enlarged
710. **Codonacanthus.**

Corolla distinctly 2-lipped :—

Placentæ not separating elastically from the valves :—

Anther-cells parallel, subequal; bracts large, imbricate ......712. **Ecbolium.**

Anther-cells placed one higher up than the other :—

Anther-cells, at least the lower, with a white basal spur-like appendage ....713. **Justicia.**

Anther-cells not spurred at base :—

Anther-cells apiculate
714. **Adhatoda.**

Anther-cells muticous :—

Bracts and bracteoles small subequal; corolla white
715. **Rhinacanthus.**

Bracts longer than bracteoles in opposite valvate pairs; corolla rose or purple
716. **Peristrophe.**

Placentæ separating elastically upwards from valves; bracts involucrate :—

Bracts arranged in a unilateral spike
717. **Rungia.**

Bracts either clustered in leaf-axils or (occasionally) laxly cymose
718. **Dicliptera.**

¶Seeds not supported by rigid retinacula; ovules in each cell of the ovary 1 :—[p. 31]

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Calyx equally 5-lobed; corolla subequally 5-lobed; ovary 2-celled; stamens 2-celled, cells divaricate ....721. **Stachytarpheta.**

Calyx 2-lipped; corolla distinctly or indistinctly 2-lipped; ovary 4-celled:—

Stamens with 2 discrete stipitate perfect cells; corolla indistinctly 2-lipped 757. **Meriandra.**

Stamens with only the posterior cell perfect, the anterior imperfect or obsolete; corolla markedly 2-lipped ....758. **Salvia.**

Class III. TRIANDRIA.

*Flowers arranged in spikelets in the axils of glumaceous bracts; leaves sheathing at the base:—[p. 39]

†Flowers in the axil of a simple glume, leaves 3-stichous or only basal, sometimes 0, the sheaths closed in front: fruit a minute nut with embryo inside the albumen; style simple with 2–3 stigmas:—[p. 34]

Intermediate hermaphrodite glumes few, not more numerous than the 2 or more lowest empty:—

Style 2-fid; perianth of 6 hypogynous bristles...1030. **Rynchospora.**

Style 3-fid; perianth 0.......... ....1031. **Cladium.**

Intermediate hermaphrodite glumes usually many, always more numerous than the 1–2 lower empty:—

Flowering glumes distichous:—

Style 2-fid; rachilla of spikelet deciduous ......1032. **Kyllinga.**

Style 3-fid, very rarely (*Cyperus* § *Anosporum*) subentire and then casually 2-lobed; nut 3-gonous:—

Rachilla of spikelet persistent ....1035. **Cyperus.**

Rachilla of spikelet deciduous:—

Fruit-bearing glumes not winged; fruit rather broad 1036. **Mariscus.**

Fruit-bearing glumes winged; fruit very narrow 1037. **Courtoisia.**

Flowering glumes spirally arranged:—

**Base of style articulate or constricted above the fruit:—[p. 34]

Stem leafless; perianth of bristles............1038. **Eleocharis.**

Stem leafy below; perianth 0:—

Style-base persisting, or if deciduous not leaving a tumour on the fruit ....1039. **Fimbristylis.**

Style-base deciduous, leaving a tumour on the fruit 1041. **Bulbostylis.**

**Base of style passing gradually into the fruit, perianth usually of scales or bristles :—[p. 33]

Hypogynous scales 6, divided to the base into linear segments 1043. **Eriophorum.**

Hypogynous scales, if any, undivided :—

Leaves hairy ; hypogynous scales 6, or 3, or 0 1044. **Fuirena.**

Leaves glabrous ; hypogynous scales 7–1, or 0 1045. **Scirpus.**

†Flowers interposed between a glume and a palea ; leaves distichous, sheaths open in front and ligulate at apex behind ; fruit a grain with embryo outside the albumen ; styles 2 free or, rarely, connate below :—[p. 33]

‡Mature spikelets separating entirely from their pedicels, or falling with them ; spikelets similar or differing in sex and structure ; perfect spikelets with 2 heteromorphous florets, the upper hermaphrodite the lower male or barren :—[p. 37]

Rachis continued beyond upper spikelet ; glumes 4 ; spikelets 1–2-flowered, subsecund..............................1049. **Chamæraphis.**

Rachis not continued beyond upper spikelet :—

§Spikelets usually in continuous spikes, racemes or panicles ; glumes herbaceous or membranous, the lower smaller, sometimes very small or suppressed ; lower flowering glume generally resembling the outer glumes in structure and venation ; the upper firmer, at length rigid, often papery to crustaceous, rarely awned or mucronate :—[p. 35]

¶Spikelets 2-flowered, upper 2-sexual, lower male or neuter, rarely (*Isachne*) both fertile :—[p. 35]

Mature spikelets surrounded singly or in clusters by a whorl of naked or plumose bristles which falls with the spikelets ; styles free or connate below ....1047. **Pennisetum.**

Mature spikelets falling entire and singly from the tips of their pedicels ; styles free :—

Spikelets with an involucel of bristles......1048. **Setaria.**

Spikelets not subtended by bristles :—

Glumes 4, all very minute ; spikelets very numerous and very small, crowded on the capillary branches of a very large panicle..................1050. **Thysanolæna.**

Glumes 4, all conspicuous or 3 conspicuous and 1 minute or obsolete :—

§Lowest glume distinct :—[p. 35]

Glumes I and II separately deciduous ; spikelets subglobose, panicled [p. 35] ....1051. **Isachne.

**Glumes I and II not separately deciduous:—[p. 34]

Lowest glume, at least, subulate-aristate; spikelets fascicled or solitary on a simple axis or on the branches of a panicle ...1052. **Oplismenus.**

Lowest glume not subulate-aristate:—

Glume II fimbriate; glume III with a deep-cleft palea and a male floret 1053. **Axonopus.**

Glume II not fimbriate; glume III with a 2-nerved or hyaline rudimentary palea or quite empty ....1054. **Panicum.**

§Lowest glume minute or 0:—[p. 34]

Lowest glume minute but usually present; glume III with generally a minute palea, its nerves straight, prominent ......1055. **Digitaria.**

Lowest glume absent; glume II (= glume III of *Digitaria*) empty, its marginal nerves curved:—

Spikelets not thickened at the base 1056. **Paspalum.**

Spikelets thickened at the base 1057. **Eriochloa.**

¶Spikelets 1-flowered, deciduous with their pedicels:—[p. 34]

Spikelets fascicled all round a slender rachis, falling in clusters of 2–4; outer glume echinate; styles free or connate ....1061. **Tragus.**

Spikelets not clustered, falling singly; glumes not echinate; styles connate below:—

Glumes without awns ....1063. **Zoysia.**

Glumes long-awned..........................1062. **Perotis.**

§Spikelets usually in pairs, one sessile the other pedicelled, or the terminal 3-nate or solitary, in the axis of a usually spike-like raceme; outer glumes more or less rigid and firmer than the flowering glumes, the lower always larger than the florets; flowering glumes membranous, often hyaline, that of the upper floret often awned or reduced to an awn; styles always distinct:—[p. 34]

††Spikelets all similar, in open or contracted panicles:—[p. 36]

Racemes of spikelets in open, compound, much-branched panicles:—

Spikelets awnless ....1066. **Saccharum.**

Spikelets awned ....1067. **Erianthus.**

Racemes of spikelets 2-nate, digitate, or approximate on a short main-axis ....1068. **Pollinia.**

††Spikelets dissimilar or (*Ophiurus*) spikelets solitary:— [p. 35]

Spikelets sunk in pits of an articulate fragile rachis:—

Sessile spikelets solitary in each internode of the spike:—

Sessile spikelets not accompanied by an upper spikelet or even the pedicel of one ....1069. **Ophiurus.**

Sessile spikelets accompanied by dissimilar pedicelled spikelets:—

Glume I globose, inflated, pitted...1070. **Manisuris.**

Glume I smooth:—

Glume I ovate-oblong ....1071. **Rottboellia.**

Glume I caudate ....1072. **Vossia.**

Sessile spikelets 2, opposite, in each internode 1073. **Mnesithea.**

Spikelets not sunk in nodes of the rachis:—

Spikelets 3, a sessile 2-flowered and two pedicelled, enclosed in a peduncled spathe on a short 1-nodal inarticulate rachis ....1074. **Apluda.**

Spikelets many or few on a plurinodal articulate rachis:—

Spikelets many, 2-nate rarely solitary, in spiciform racemes solitary 2-nate or digitate or approximate on a short main-rachis; lower floret of sessile spikelet male:—

Margin of glume I of sessile spikelet inflexed 1075. **Ischæmum.**

Margin of glume I of sessile spikelet not inflexed:—

Spikelets 2-flowered; leaves lanceolate 1077. **Apocopis.**

Spikelets 1-flowered; leaves cordate at junction with sheath .... 1078. **Arthraxon.**

Spikelets in compound panicles or spiciform racemes variously disposed, 2-nate rarely 3-nate; lower floret of all the spikelets empty; upper usually awned or reduced to an awn:—

Spikelets in alternating pairs or the lowest solitary:—

Sessile spikelets more than 2, usually many; inflorescence usually elongate...1080. **Andropogon.**

Sessile spikelets 2 only; inflorescence very short 1081. **Pseudanthistiria.**

Spikelets dimorphic, the 4 lower sessile, forming an involucre round the upper:—

‡‡Rachis articulate above the involucrant spikelets [p. 37] ....1082. **Anthistiria.**

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‡‡Rachis articulate below the involucrant spikelets [p. 36]..................................1083. **Iseilema.**

‡Mature spikelets breaking up, leaving the peristent or subpersistent glumes on the pedicel, or if falling entire not composed of 2 heteromorphous florets:—[p. 34]

§Spikelets not inserted in notches or pits of a simple rachis:—[p. 39]

¶Spikelets panicled, or if spicate not secund:—[p. 38]

Spikelets 1-flowered, rachilla not or rarely produced beyond the floret; awns when present twisted; styles free:—

Glume III hardened in fruit and tightly clasping the grain; awns usually 3-fid ....1087. **Aristida.**

Glumes all membranous; awns if present simple:—

Spikelets laterally compressed:—

Glumes I and II firm, awned ....1088. **Polypogon.**

Glumes I and II membranous, not awned:—

Pericarp of grain adnate to seed ......1089. **Agrostis.**

Pericarp of grain loose...............1090. **Sporobolus.**

Spikelets very narrow, terete; glumes finely acuminate or awned..1091. **Garnotia.**

Spikelets 2- or more-flowered:—

Rachilla not continued beyond the upper floret:—

Spikelets not awned; rachilla elongated between the flowering glumes, but not penicillately hairy; styles free 1092. **Cœlachne.**

Spikelets awned:—

Florets 2, dissimilar, the lower awnless male or barren; styles free or connate below ....1093. **Arundinella.**

Florets 2-many, similar except the uppermost, which are gradually reduced; styles free ...1094. **Eriachne.**

Rachilla continued beyond the upper floret or if not continued (*Phragmites*) then elongated between the flowering glumes and penicillately hairy; styles always free:—

Spikelets awned with awn twisted ....1095. **Avena.**

Spikelets not awned or if awned with the awn not twisted:—

Leaves tesselately nerved; fruiting glumes with reflexed submarginal bristles......................1096. **Centotheca.**

Leaves parallel-nerved; fruiting glumes without any submarginal bristles:—

Spikelets very minute, in globose clusters on an elongated simple rachis [p. 38]...1097. **Elytrophorus.

GSL

**Spikelets conspicuous, not in globose clusters :—[p. 37]

Flowering glumes 1–3-nerved :—

Spikelets penicillate with long silky hairs on the flowering glumes or the callus or both; paniculate; lowest flowering glume sometimes male or neuter :—

Rachilla glabrous; flowering glumes dorsally hairy beyond the middle ……1098. **Arundo.**

Rachilla hirsute :—

Flowering glumes glabrous 1099. **Phragmites.**

Flowering glumes penicillate with long hairs 1100. **Triraphis.**

Spikelets not penicillate with long silky hairs; many-flowered :—

Outer glumes shorter than lowest flowering glume; grain very minute, terete 1101. **Eragrostis.**

Outer glumes longer than lowest flowering glume; grain broad, concave 1102. **Myriostachya.**

Flowering glumes 5- or more-nerved; spikelets panicled……………………………….1103. **Bromus.**

¶ Spikelets 2-seriate and secund on an inarticulate spike or on the spiciform branches of a panicle; styles free :—[p. 36]

Spikelets on the long spiciform branches of a panicle :—

Flowering glumes 3-toothed………………1104. **Diplachne.**

Flowering glumes entire or simply aristate 1105. **Leptochloa.**

Spikelets in simply digitate or simply racemed spikes :—

Spikelets in pedicelled, deciduous, articulate clusters 1106. **Gracilea.**

Spikelets not clustered :—

Spikelets 1-flowered :—

Spikelets awnless :—

Spikes solitary terminal ………..1107. **Microchloa.**

Spikes digitate ……………………….1108. **Cynodon.**

Spikelets awned; spikes solitary spicate or racemed 1109. **Chloris.**

Spikelets 2- or more-flowered :—

Spikelets crowded on a solitary spike…1110. **Tripogon.**

GSL

Spikelets in numerous spikes :—

Spikelets digitate or whorled ....1111. **Eleusine.**

Spikelets racemed on a long rachis 1112. **Dinebra.**

§Spikelets inserted in notches or pits of a simple rachis :— [p. 37]

Spikelets solitary at the nodes of the spikes :—

Plane of spikelets radial to the rachis ......1113. **Oropetium.**

Plane of spikelets tangential to the rachis ...1114. **Triticum.**

Spikelets 2 or more, collected in fascicles at the nodes of the spikes ....1115. **Hordeum.**

*Flowers not in spikelets, inflorescence without glumaceous bracts :— [p. 33]

Leaves long and narrow, sheathing at the base, rarely reduced to scales or sheaths, nerves all parallel ; perianth 2-seriate, with normally 3 segments in each whorl :—

Ovary inferior :—

Perianth of 2 dissimilar whorls, 3 outer segments calycine ; leaves all radical tufted ; aquatic plants ....888. **Blyxa.**

Perianth of 2 similar whorls, all 6 segments petaloid :—

Ovary 1-celled ; leaves mostly radical tufted, sometimes all reduced to scales....................................891. **Burmannia.**

Ovary 3-celled ; stems more or less leafy :—

Stem leafless between the few radical basal leaves and the single large plicate floral leaf just under the inflorescence 948. **Cipura.**

Stem leafy throughout ....949. **Belamcanda.**

Ovary superior :—

Perianth of 2 dissimilar whorls ; outer segments calycine :—

Stem a leafless scape with capitate flowers ; leaves all radical 974. **Xyris.**

Stem leafy :—

Cymes solitary, within a spathaceous bract 975. **Commelina.**

Cymes paniculate, bracts not spathaceous ...976. **Aneilema.**

Perianth of 2 similar whorls, more or less calycine ; erect tufted grassy herbs..981. **Juncus.**

Leaves not sheathing at the base, venation reticulate, never reduced to sheaths or scales ; short and broad, or if narrow with perianth-segments 4 or 5 in each whorl :—

†Perianth none ; styles free ; flowers in cylindric spikes ; leaves simple [p. 40]..791. **Piper.**

†Perianth of at least one whorl present:—[p. 39]
Leaves compound:
Leaflets gland-dotted; leaves 3-foliolate or odd-pinnate
133. **Zanthoxylum.**
Leaflets not gland-dotted:—
Leaves even-pinnate; leaflets opposite:—
Petals 5 ....278. **Cassia.**
Petal 1 ....284. **Intsia.**
Leaves odd-pinnate; leaflets alternate.........148. **Ailanthus.**
Leaves simple:—
Styles 3 or more, free; carpels united:—
Ovary 1-celled; leaves always opposite; petals small but usually present ....66. **Stellaria.**
Ovary 3–5-celled:—
Leaves opposite or falsely whorled or alternate; petals 0
383. **Mollugo.**
Leaves always opposite; petals 3–5 ....74. **Bergia.**
Style simple or styles connate:—
Leaves alternate:—
Leaves entire ....169. **Olax.**
Leaves 2-lobed at apex ....279. **Bauhinia.**
Leaves opposite:—
Shrubs, trees or woody climbers:—
Sepals free, orbicular, imbricate:—
Fruit a berry; seeds not winged............182. **Salacia.**
Fruit a capsule; seeds winged ......183. **Hippocratea.**
Sepals connate below, valvate; fruit a drupe
203*. **Bouea.**
Herbs:—
Sepals 5, free ....69. **Polycarpon.**
Sepals connate in a campanulate tube:—
Leaves large, 3–5-nerved from the base, often unequal; calyx-teeth and petals always 3 ....340. **Sonerila.**
Leaves small, penninerved, equal; calyx-teeth 3–5, petals often 0 ....342. **Ammannia.**

Class IV. TETRANDRIA.

*Inflorescence spicate on a fleshy spadix subtended by a large spathe; leaves simple:—[p. 41]
§Epiphytic climbers with smooth leaves:—[p. 41]
¶ Berries free; ovules and seeds solitary [p. 41]...1009. **Scindapsus.**

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¶Berries confluent; ovules and seeds numerous:—[p. 40] 1010. **Rhaphidophora.**

§Marsh herbs with leaves prickly on stalks and nerves [p.40] 1012. **Lasia.**

*Inflorescence never subtended by a spathe:—[p. 40]

Floating or submerged aquatic herbs; leaves simple:—

Petioles of upper rosulate floating leaves inflated and vesicular, the lower submerged leaves pectinate opposite ....353. **Trapa.**

Petioles, if present, not inflated and vesicular:—

Perianth double, of calyx and corolla:—

Corolla gamopetalous; leaves large, floating, cordate, all alternate; ovary 1-celled ....601. **Limnanthemum.**

Corolla of 2–4 free petals; leaves small, submerged, narrow-linear, usually whorled, rarely alternate; ovary 4- or 2-celled:—

Ovules solitary, pendulous in each cell of the inferior ovary; hypogynous scales absent ....318. **Myriophyllum.**

Ovules several on axial placentas in each cell of the free ovary at base of calyx-tube; hypogynous scales 4, 2-fid 343. **Hydrolythrum.**

Perianth single, of 4 green, valvate segments; carpels 4 1020. **Potamogeton.**

Terrestrial herbs, shrubs, or trees, or if growing in or near ponds or marshes, the leaves not floating or submerged:—

Climbing herbs or shrubs, raising themselves by the aid of spirally twisted tendrils; leaves simple or compound; petals valvate, stamens opposite petals..188. **Vitis.**

Erect herbs, shrubs, or trees, or if climbing raising themselves by voluble stems or by prickles, if with tendrils (*Bauhinia* sometimes) these simply hooked or subcircinate not spiral:—

Leaves compound:—

Leaflets gland-dotted.............................133. **Zanthoxylum.**

Leaflets not gland-dotted:—

Ovary 5-celled; seeds winged.......................166. **Cedrela.**

Ovary 1-celled; seeds not winged:—

Ovule and seed solitary; unarmed trees with once pinnate odd-pinnate leaves.....................................210. **Rhus.**

Ovules and seeds many; prickly and bristly herbs with digitately twice pinnate even-pinnate leaves...300. **Mimosa.**

Leaves simple:—

†Leaves alternate:—[p. 43]

‡Perianth single:—[p. 42]

Perianth tubular and constricted above the ovary; stamens alternate with perianth-lobes [p. 42] 807. **Elæagnus.

GSL

**Perianth deeply partite or the segments quite free, if tubular below not constricted above the ovary :—[p. 41]
  Ovary inferior ....330. **Gyrocarpus.**
  Ovary superior :—
    Stamens alternate with perianth-segments
                786. **Rivina.**
    Stamens opposite perianth-segments :—
      Perianth-segments valvate ; shrubs or trees :—
        Ovule solitary :—
          Ovule erect ; bracts small ; stem climbing
                172. **Cansjera.**
          Ovule pendulous ; bracts large ; stem erect
                171. **Lepionurus.**
        Ovules 2, ascending ; stem erect......803. **Helicia.**
      Perianth-segments imbricate ; ovule solitary :—
        Perianth green ; ovule pendulous ; small trees
                853. **Celtis.**
        Perianth coloured ; ovule erect ; herbs
                787. **Polygonum.**

‡Perianth double :—[p. 41]
  ††Petals free or only slightly connate below :—[p. 43]
    Petals valvate ....169. **Olax.**
    Petals imbricate :—
      §Style simple or styles united :—[p. 43]
        Ovary of 1 solitary free carpel ; leaves 2-lobed at the apex ....279. **Bauhinia.**
        Ovary of 2 or more connate carpels ; leaves not 2-lobed at apex :—
          ¶Ovary superior ; petals hypogynous :—[p. 43]
            Leaves pinnately lobed ; fruit a 2-valved capsule with a partition (replum) between the 2 placentas :—
              Fruit long, narrow, cylindric
                39. **Nasturtium.**
              Fruit short, orbicular ....46. **Lepidium.**
            Leaves not lobed, margins entire or only serrate :—
              Stamens alternate with petals :—
                Ovules and seeds pendulous ......176. **Ilex.**
                Ovules and seeds erect or ascending
                180. **Gymnosporia.**
              Stamens opposite the petals ......200. **Sabia.**

¶Ovary inferior; petals epigynous [p. 42]
352. **Ludwigia.**

§Styles 2 or more than 2, free:—[p. 42]

Trees or shrubs; stamens opposite the petals
355. **Homalium.**

Small viscid-glandular herbs with insectivorous leaves; stamens alternate with the petals
316. **Drosera.**

††Petals united in a gamophyllous corolla; ovary superior:—[p. 42]

Stamens opposite the corolla-lobes; leaves entire:—

Small annual herbs; seeds many in a circumscissile capsule ....516. **Centunculus.**

Shrubs, mostly climbing; seeds solitary in a small berry-like fruit....................................518. **Embelia.**

Stamens alternate with the corolla-lobes:—

Corolla plicate in bud; ovules many; leaves entire, or variously lobed or pinnately cut; shrubs or herbs, often prickly ....635. **Solanum.**

Corolla-lobes imbricate in bud; leaves entire, or with margins serrate or crenate; unarmed:—

Ovules 2 in each chamber of a 2-celled, or 1 in each chamber of a 4-celled ovary; corolla quite regular:—

Styles 2; a prostrate herb............609. **Coldenia.**

Style terminal on an entire ovary; trees or shrubs:—

Style with a twice 2-partite stigma, not annulate ....604. **Cordia.**

Style shortly 2-lobed, with a horizontal ring below the stigma ....605. **Tournefortia.**

Ovules many in each cell of a 2-celled ovary; corolla somewhat oblique; herbs.........642. **Celsia.**

†Leaves opposite:—[p. 41]

Perianth single; trees; lobes of perianth valvate:—

Ovary 1-celled; ovules 2–3 on a free central placenta; stamens opposite perianth-lobes ....810. **Santalum.**

Ovary 2-celled; ovules many on axial placentas; stamens alternate with perianth-lobes
346. **Crypteronia.**

Perianth double, or if single (*Ammannia* sometimes), then small herbs:—

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Petals free or, rarely (*Ammannia* sometimes), 0 :—
Stamens hypogynous :—
Sepals free :—
Styles 3–5, free ; small herbs :—
Ovary 1-celled ....66. **Stellaria.**
Ovary 2–5-celled ....74. **Bergia.**
Styles combined :—
Herbs ; ovary 1-celled...............69. **Polycarpon.**
Shrubs ; ovary 3-celled..................182. **Salacia.**
Sepals connate below ....203*. **Bouea.**
Stamens inserted on the mouth of a campanulate gamosepalous calyx :—
Small herbs ; petals minute or 0 ......342. **Ammannia.**
Shrubs ; petals conspicuous, wrinkled...345. **Lawsonia.**
Petals connate in a gamophyllous corolla :—
Stamens opposite the corolla-lobes ......808. **Loranthus.**
Stamens alternate with corolla-lobes :—
‡Ovary inferior :—[p. 46]
Leaves opposite ; stipules 0 ...506. **Campanumœa.**
Leaves in decussate rarely distichous pairs with interpetiolar stipules, or if stipules 0 leaves whorled :—
¶Ovules usually numerous, never fewer than 2 in each cell of the ovary :—[p. 45]
Corolla-lobes twisted in bud :—
Fruit a capsule ; seeds many, small ; flowers in terminal panicles.........407. **Wendlandia.**
Fruit a berry ; seeds few, large ; flowers axillary :—
Flowers in spikes ; ovules pendulous from apex of cell ....420. **Petunga.**
Flowers in fascicles or small cymes :—
Ovules 6–10 in each cell, pendulous from its apex ....421. **Hyptianthera.**
Ovules 2–3 in each cell, attached to a lateral placenta ....422. **Diplospora.**
Corolla-lobes valvate in bud :—
Corolla-lobes reduplicate-valvate ; shrubs with indehiscent berries ....415. **Adenosacme.**
Corolla-lobes simply valvate ; herbs or undershrubs with dehiscent capsules, or if fruit indehiscent (*Hedyotis* sometimes) then small herbs with dry minute fruits :—

Calyx-teeth in fruit contiguous; capsule loculicidal or septicidal, or rarely indehiscent; seeds usually angular 410. **Hedyotis.**

Calyx-teeth in fruit remote; capsule loculicidal above them, rarely indehiscent:—

Seeds minute, angular 411. **Oldenlandia.**

Seeds plano-convex, or globose with a ventral cavity ....412. **Anotis.**

¶Ovules solitary in each cell of the ovary:—[p. 44]

Corolla-lobes twisted in bud:—

Flowers paniculate or corymbose:—

Bracts coriaceous, never sheathing 425. **Ixora.**

Bracts membranous, the lower sheathing 424. **Pavetta.**

Flowers axillary, fascicled or solitary 426. **Coffea.**

Corolla-lobes valvate in bud:—

**Leaves opposed with interpetiolar stipules:—[p. 46]

††Fruit a fleshy or dry drupe, with two or more pyrenes:—[p. 46]

Flowers cohering by their calyx-tubes in a firmly fleshy head.........427. **Morinda.**

Flowers free:—

Erect shrubs or trees; pyrenes in a leathery or fleshy drupe:—

Leaves decussate:—

Flowers in axillary fascicles or cymes:—

Ovary 2-celled 428. **Canthium.**

Ovary 3–5-celled 429. **Vangueria.**

Flowers in terminal cymes 430. **Psychotria.**

Leaves distichous 431. **Lasianthus.**

Twining herbs or shrubs; pyrenes in a papery drupe..............433. **Pæderia.**

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††Fruit of 2 separable cocci; herbs:—[p. 45]
Cocci indehiscent:—
Flowers in cymes; cocci small 434. **Knoxia.**
Flowers solitary, axillary; cocci large, corky..................435. **Hydrophylax.**
Cocci one only or both ultimately dehiscing ventrally ......436. **Spermacoce.**
Leaves whorled, stipules 0 [p. 45] 437. **Rubia.

‡Ovary superior:—[p. 44]
Corolla regular:—
Ovary 1-celled:—
Ovule solitary ....538. **Salvadora.**
Ovules many ....600. **Swertia.**
Ovary 2-celled; ovules many:—
Corolla-lobes contorted:—
Corolla-lobes twisted to right...596. **Exacum.**
Corolla-lobes twisted to left...542. **Melodinus.**
Corolla-lobes not twisted:—
Fruit indehiscent ....595. **Strychnos.**
Fruit dehiscent:—
Corolla-lobes valvate......592. **Mitrasacme.**
Corolla-lobes imbricate......593. **Buddleia.**
Corolla oblique:—
Ovules in each cell of ovary numerous 662. **Scoparia.**
Ovules in each cell of ovary solitary or at most 2, collateral:—
Fruit not 4-lobed:—
Fruit a small drupe with 4 pyrenes 724. **Callicarpa.**
Fruit a leathery capsule ......735. **Avicennia.**
Fruit 4-lobed, separating into 4 distinct nutlets:—
§Calyx subequally 5-lobed:—[p. 47]
¶Calyx-lobes short; stamens exserted:—[p. 47]
Corolla 4-fid with a spreading lip 746. **Pogostemon.**
Corolla subequally 4-fid 747. **Dysophylla.**

¶Calyx-lobes long, plumose [p. 46] 748. **Colebrookia.**

§Calyx declinate 2-lipped [p. 46] 749. **Perilla.**

CLASS V. PENTANDRIA.

Inflorescence spicate on a fleshy spadix subtended by a large spathe; leaves simple :—

Epiphytic climbers with smooth leaf-stalks and leaves 1010. **Rhaphidophora.**

Marsh herbs with prickly leaf-stalks and leaves ....1012. **Lasia.**

Inflorescence not within a spathe, or if spathaceous not spicate :—

Floating or partly submerged aquatic herbs :—

Corolla irregular, petals free; stems fistular, floating, and rooting at the nodes; branches leafy, erect; leaves not floating :—

Flowers large, showy, in few-flowered racemes; leaves linear-lanceolate, simple; ovary 5-celled, superior ......132. **Hydrocera.**

Flowers small, in many-flowered umbels; leaves pinnately compound; ovary 2-celled, inferior ....390. **Œnanthe.**

Corolla regular, petals more or less connate, leaves floating :—

Ovary 1-celled :—

Leaves small, whorled, spathulate or orbicular, somewhat vesicular; petals connate in a cap; fruit a 5-valved capsule 317. **Aldrovanda.**

Leaves large, cordate, alternate, or only subopposite, flat; petals connate in a deeply lobed rotate corolla; fruit subindehiscent..601. **Limnanthemum.**

Ovary 2-celled; leaves cordate or hastate; petals connate in a campanulate corolla; fruit a 2–4-seeded capsule ...626. **Ipomœa.**

Terrestrial herbs, shrubs, or trees, or if growing in or near water the stems erect and the leaves not floating :—

*Climbing herbs or shrubs with spirally twisted tendrils :—[p. 48]

Flowers with no corona; style simple; petals connate at tips in a calyptra; stamens opposite petals, the filaments free throughout; style simple; leaves simple or compound ....188. **Vitis.**

Flowers with corona outside stamens; styles 3; petals free; stamens alternate with petals, adnate below to gynophore; leaves simple, entire or lobed or partite ....357. **Passiflora.**

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*Erect herbs, or shrubs, or trees, or if climbing raising themselves by voluble stems or by prickles; if by tendrils (*Helinus*, *Ancistrocladus*, *Uncaria*, *Bauhinia* sometimes, and *Strychnos* sometimes) then these simply hooked or subcircinate, but not spiral :—[p. 47]

Leaves absent; yellowish parasitic twiners............613. **Cuscuta.**
Leaves present :—
†Leaves compound :—[p. 49]
‡Leaves pinnately compound :—[p. 49]
Leaves simply pinnate or pinnately 3-foliolate :—
Leaves gland-dotted ....133. **Zanthoxylum.**
Leaves not gland-dotted :—
Leaves odd-pinnate :—
Leaves opposite :—
Petals free ....199. **Turpinia.**
Petals connate in a tube ....402. **Sambucus.**
Leaves alternate :—
Seeds winged; ovary 5-celled.........166. **Cedrela.**
Seeds not winged :—
Ovary 2-celled, seeds arillate ...197. **Harpullia.**
Ovary 1-celled, seeds not arillate......210. **Rhus.**
Leaves even-pinnate ....278. **Cassia.**
Leaves twice or more than twice pinnate :—
Leaves evenly twice pinnate :—
Anthers gland-crested ....296. **Neptunia.**
Anthers not gland-crested ....298. **Desmanthus.**
Leaves unevenly twice or more than twice pinnate :—
Leaves opposite..............................678. **Oroxylum.**
Leaves alternate :—
Flowers not in umbels :—
Flowers in panicles; carpels 3, united in a 1-celled ovary ....213. **Moringa.**
Flowers in dense, simple racemes; carpel solitary 285. **Acrocarpus.**
Flowers in umbels :—
††Carpels 2 :—[p. 49]
‡‡Petals imbricate; flowers in compound umbels :—[p. 49]
§§Secondary ridges of the fruit inconspicuous :—[p. 49]
¶¶Fruit constricted at commissure or laterally compressed; ridges of fruit slender :—[p. 49]

Furrows of the fruit with solitary vittæ 386. **Carum.**

Furrows of the fruit with 2–3 vittæ 387. **Pimpinella.**

¶¶Fruit widest at commissure, often dorsally compressed; ridges of fruit distinct, furrows with solitary vittæ:—[p. 48]

Fruit oblong or subcylindric, not winged:—

Ridges of the fruit not thickened:—

Petals white ....389. **Seseli.**

Petals yellow ......388. **Fœniculum.**

Ridges of the fruit thick and corky; petals white...............390. **Œnanthe.**

Fruit much compressed dorsally, the lateral ridges winged...391. **Peucedanum.**

§§Secondary ridges of fruit prominent:—[p. 48]

Fruit glabrous ....392. **Coriandrum.**

Fruit setosely bristly............393. **Daucus.**

‡‡Petals valvate; umbels racemed or panicled:—[p. 48]

Pedicels jointed; albumen uniform 397. **Panax.**

Pedicels continuous; albumen ruminated 395. **Heteropanax.**

††Carpels 4–5; pedicels jointed; petals faintly imbricate [p. 48] ....394. **Aralia.**

‡Leaves digitately compound; flowers in panicled umbels:—[p. 48]

Carpels 5, styles free ....398. **Heptapleurum.**

Carpels 2, styles united ....396. **Brassaiopsis.**

†Leaves simple:—[p. 48]

§Leaves alternate (in *Trichodesma* alternate only above); or if subopposite (*Sarcosperma*) with stamens opposite the petals:—[p. 60]

¶Perianth double:—[p. 59]

**Petals free or irregularly connate, rarely (*Holigarna*, *Tamarix*), faintly united at the very base; the stamens never adnate to the petals:—[p. 52]

***Petals valvate or open in bud:—[p. 50]

†††Style simple:—[p. 50]

‡‡‡Leaves palmately lobed; ovary inferior; stamens alternate with petals [p. 50] 396. **Brassaiopsis.**

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‡‡‡Leaves penninerved; ovary superior:—[p. 49]
Ovules 3 pendulous from tip of a central placenta; stamens opposite edges, rarely opposite centre of irregularly united petals 169. **Olax.**
Ovule solitary pendulous from apex of cell; stamens opposite free petals.........170. **Opilia.**
†††Styles two or more, free:—[p. 49]
Ovary superior; flowers in small cymes; leaves penninerved; æstivation open ...168. **Chailletia.**
Ovary inferior; flowers in umbels; leaves palmately-nerved ....384. **Hydrocotyle.**
***Petals imbricate or contorted in bud:—[p. 49]
††Stamens alternate with petals:—[p. 52]
†Styles or stigmas 2 or more than two, free:—[p. 51]
Ovary inferior:—
Ovary 2-celled, styles 2; leaves with petiole dilated at the base; flowers in umbels:—
Umbels simple; leaves cordate or rotund 384. **Hydrocotyle.**
Umbels compound; leaves linear 385. **Bupleurum.**
Ovary 1-celled, styles 3; petiole not sheathing; flowers racemose or panicled:—
Petals contorted; lobes of calyx accrescent 85. **Ancistrocladus.**
Petals truly imbricate; lobes of calyx not accrescent ....206. **Holigarna.**
Ovary superior or half-superior:—
‡‡Leaves conspicuous:—[p. 51]
‡Ovary 1-celled:—[p. 51]
Seed large, solitary ...207. **Semecarpus.**
Seeds few or many, small:—
Leaves beset with glandular hairs 316. **Drosera.**
Leaves not glandular:—
Sepals and petals dissimilar 356. **Turnera.**
Sepals and petals alike or nearly so 355. **Homalium.**

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‡Ovary 2–5-celled :—[p. 50]

Sepals free ; ovary 3–5-celled :—

Styles and carpels 5 ......121. **Linum.**

Styles and carpels 3–4 122. **Reinwardtia.**

Sepals more or less connate below ; ovary 2-celled ; styles 2 ....181. **Kurrimia.**

‡‡Leaves minute and scale-like :—[p. 50] 73. **Tamarix.**

†Style solitary or styles united :—[p. 50]

Corolla irregular :—

Leaves equally 2-lobed ; carpel solitary ; petals 5 ....279. **Bauhinia.**

Leaves not 2-lobed ; carpels more than one :—

Ovary superior ; leaves not sheathing :—

Anthers free ; ovary 1-celled 54. **Ionidium.**

Anthers connate ; ovary 5-celled 131. **Impatiens.**

Ovary inferior, 3-celled ; leaf-sheath large and stem-clasping............943. **Ravenala.**

Corolla regular :—

§§Sepals and petals 5, rarely 4 ; leaves penninerved, rarely palminerved, with reticulate venation ; petiole not sheathing :—[p. 52]

Ovary superior :—

Sepals valvate, free ...118. **Triumfetta.**

Sepals imbricate, more or less connate below :—

Ovary 3–5-celled ; petals not accrescent :—

Flowers cymose ; ovary at base confluent with disk 180. **Gymnosporia.**

Flowers spicate, racemose, or paniculate ; ovary at base free from disk 179. **Celastrus.**

Ovary 1-celled ; petals accrescent 204. **Swintonia.**

Ovary inferior :—

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Sepals imbricate, shortly connate below; ovary 1-celled and 1-ovuled 205. **Drimycarpus.**

Sepals valvate, united below in a considerable tube; ovules more than one:—

Ovary 1-celled; ovules 2–5 329. **Lumnitzera.**

Ovary 4–5-celled; ovules very many 352. **Ludwigia.**

§§Sepals and petals, each 3; leaves parallel-nerved with stem-clasping leaf-sheath; ovary 2-celled:—[p. 51] ....979. **Floscopa.**

††Stamens opposite the petals:—[p. 50]

Sepals valvate:—

Ovary superior or half-superior:—

Fruit a dry or fleshy drupe with no termina wing ....184. **Zizyphus.**

Fruit a dry nut prolonged above in an oblong-linear leathery wing ....185. **Ventilago.**

Ovary quite inferior, the fruit tipped by the persistent calyx:—

Fruit 3-winged; flowers in paniculate fascicles 186. **Gouania.**

Fruit terete, ovate; flowers subumbellate 187. **Helinus.**

Sepals imbricate; ovary superior ......200. **Sabia.**

**Petals united in a gamophyllous corolla; if free (*Embelia*) the stamens adnate to the petals:—[p. 49]

†Ovary inferior or half-inferior:—[p. 53]

‡Stamens not adnate to corolla:—[p. 53]

Leaves with large stem-clasping leaf-sheaths, venation parallel from a strong midrib; fruit indehiscent ....944. **Musa.**

Leaves without leaf-sheaths, venation reticulate; fruit dehiscent:—

Capsule loculicidal within the calyx-teeth:—

Corolla stellately 5-partite 508. **Cephalostigma.**

Corolla campanulate ...509. **Wahlenbergia.**

Capsule opening below the calyx-teeth 510. **Campanula.**

‡Stamens adnate to corolla-tube; leaves reticulate without leaf-sheath; capsule circumscissile [p. 52] 507. **Sphenoclea.**

†Ovary superior:—[p. 52]

Stamens opposite the petals or corolla-lobes:—

Styles 5 free; ovary 1-ovuled ......512. **Ægialitis.**

Styles connate, or style simple:—

Stamens free from corolla-tube; ovary 1-ovuled; style 5-armed above ....513. **Plumbago.**

Stamens adnate to corolla-tube; style simple:—

Ovary 1-locular with a free-central placenta; ovules 2 or more; staminodes 0:—

Fruit a capsule; herbs:—

Capsule dehiscing by valves:—

Corolla-lobes imbricate 514. **Androsace.**

Corolla-lobes contorted 516*. **Lysimachia.**

Capsule circumscissile 516. **Centunculus.**

Fruit indehiscent or follicular; shrubs or trees:—

Calyx nearly enclosing the many-seeded berry ....517. **Mæsa.**

Calyx free from the one-seeded fruit:—

Petals free or only slightly connate at base, imbricate............518. **Embelia.**

Petals connate, lobes twisted to right:—

Fruit globose, quite indehiscent 519. **Ardisia.**

Fruit cylindric, curved, splitting along one side.........520. **Ægiceras.**

Ovary 2- or more-celled; ovules in each cell one, adnate to inner angle; trees; stamens with 5 alternate staminodes:—

Leaves subopposite; albumen none; ovary glabrous......................521. **Sarcosperma.**

Leaves quite alternate; seeds albuminous; ovary villous ....522. **Sideroxylon.**

Stamens alternate with corolla-lobes, usually adnate to corolla:—

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Styles distinct:—

Corolla-lobes 5, imbricate; stigmas to each style simple, capitate:—

Fruit a drupe with 4 1-seeded pyrenes 609. **Coldenia.**

Fruit a capsule:—

Seeds very many ....603. **Hydrolea.**

Seeds few, 1–4 ....616. **Cressa.**

Corolla-limb subentire, plicate; stigmas to each style 2, linear.......................617. **Evolvulus.**

Styles connate:—

Carpels 2 free, only the styles united:—

Fruit of 2 indehiscent fibrous and woody carpels...............................545. **Cerbera.**

Fruit of 2 follicles ....546. **Plumeria.**

Carpels connate as well as the styles:—

Corolla with a ring of hairs or scales in the throat:—

Throat of corolla with many hairs that conceal the stamens; fruit a 2-locular drupe ....544. **Thevetia.**

Throat of corolla with 5 flat scales not concealing the stamens; fruit of 4 nutlets attached to a carpophore:—

Nutlets with scar of attachment continued to their apices, produced downwards below the scar 611. **Cynoglossum.**

Nutlets with scar of attachment not extending to their apices, more or less produced upwards 610. **Bothriospermum.**

Corolla-throat naked:—

‡‡Ovules numerous in each cell of the 2-celled rarely spuriously 4-celled ovary:—[p. 55]

††Fruit an indehiscent berry:—[p. 55]

**Corolla rotate or wide-campanulate:—[p. 55]

§Anthers longer than filaments, connivent in a cone, not dehiscent throughout their length:—[p. 55]

Anthers opening introrsely by longitudinal slits, their tips empty; leaves pinnatisect

634. **Lycopersicum.**

Anthers opening by apical pores or short apical slits; leaves entire, lobed or pinnatifid

635. **Solanum.**

§Anthers not longer than filaments and not connivent in a cone, dehiscing throughout their length by lateral slits:—[p. 54]

Calyx not enlarging materially in fruit ....636. **Capsicum.**

Calyx enlarged in fruit so as to overtop the berry...637. **Physalis.**

**Corolla urceolate; calyx enlarged in fruit and overtopping the berry [p. 54]

638. **Withania.**

††Fruit capsular; valves completely or partially separating:—[p. 54]

Flowers axillary, solitary; corolla plicate; seeds somewhat compressed, embryo curved ....639. **Datura.**

Flowers in terminal panicles; corolla induplicate-valvate; seeds hardly compressed; embryo straight

640. **Nicotiana.**

‡‡Ovules 2, less often 1, rarely 4 in each cell of the ovary:—[p. 54]

†Corolla-lobes imbricate or, if contorted (*Trichodesma*), not plicate:—[p. 56]

Stamens very slightly adnate to base of corolla-tube; flowers polygamous; drupe with 2 or more 1-seeded stones

176. **Ilex.**

Stamens distinctly attached to tube or throat of corolla; hermaphrodite:—

Style twice 2-partite; drupe with one 4-1-seeded stone ...604. **Cordia.**

Style only once 2-partite or simple:—

Corolla - lobes imbricate; drupe with two 2-seeded or four 1-seeded stones :—

Styles depressed-conical at the apex or with a horizontal ring below or at the stigma :—

Style short, shortly 2-lobed; stones 2, each 2-seeded; shrubs usually more or less scandent...605. **Tournefortia.**

Style elongated, dilated at the apex, stigma above the ring either 0, or elongate lanceolate simple, or linear double; stones 4, each 1-seeded; herbs 606. **Heliotropium.**

Styles elongated, not dilated or annular at the apex :—

Style simple ...607. **Rhabdia.**

Style more or less 2-partite 608. **Ehretia.**

Corolla - lobes contorted; *leaves opposite below;* calyx enlarged in fruit; fruit of 4 nutlets 612. **Trichodesma.**

†Corolla-limb plicate or induplicate :— [p. 55]

§Corolla-tube more or less uniformly enlarged from base to apex, the 5 bands on the lobes rarely clearly defined from the intervening spaces; pollen not spinescent :—[p. 58]

Fruit indehiscent, woody or fleshy, rather large; style short or none; stigma 5–10-rayed; corolla - lobes 2-fid ....614. **Erycibe.**

Fruit dehiscent, or if not dehiscent (*Porana* sometimes), then small and with thin, fragile walls :—

Flowers in racemes or panicles; ovary 1-locular 2-ovuled, rarely 4-

ovuled and 1–2-locular; capsule 1-seeded indehiscent or rarely 2-valved; outer 3 or all the sepals enlarged in fruit; style entire or shortly 2-lobed ……615. **Porana.**

Flowers in cymes or solitary; capsule valvate or opercular, rarely dehiscing irregularly:—

Styles 2, united below; sepals hardly enlarged in fruit; cymes subcapitate; capsule dehiscing irregularly ……618. **Bonamia.**

Style entire, stigmas usually 2:—

Ovary 1-locular; capsule 4-valved, 4-seeded; stigmas short, oblong; calyx-lobes not enlarged:—

Bract enveloping the calyx; pollen spherical 619. **Calystegia.**

Bract not enveloping the calyx; pollen polyhedral 620. **Hewittia.**

Ovary 2-locular, or sometimes 4-locular:—

Outer 3 sepals much larger than the 2 inner and decurrent on the peduncle; stigmas capitate 621. **Aniseia.**

Outer 3 sepals not larger than the 2 inner nor decurrent on the peduncle:—

*Stigmas elongated:—[p. 58]

†Stigmas filiform; ovary 2-locular, 4-ovuled, capsule 4-valved or indehiscent; hairs simple or rarely 2-branched [p. 58] 622. **Convolvulus.**

†Stigmas elliptic, short or long; ovary 2-locular, 4-ovuled; capsule 8-valved; hairs 3–many-branched [p. 57]

623. **Jacquemontia.**

*Stigmas globose:—[p.57]

Capsule 4-valved; ovary 2-locular or often 4-locular; fruiting sepals not enlarged; bands of corolla usually with 5 purple lines; stem not winged

624. **Merremia.**

Capsule with circumscissile dehiscence; ovary 2-locular; fruiting sepals considerably enlarged; bands of corolla without lines; stem winged

625. **Operculina.**

§Corolla-tube not uniformly enlarged from base to apex, the 5 bands on the lobes clearly defined by 2 prominent lines; pollen spinescent:—[p. 56]

**Fruit dehiscent, or if indehiscent then with thin, fragile walls:—[p. 59]

Stamens arising from the backs of 5 scales attached to the corolla-tube; flowers small urceolate, fasciculate; fruit 4-valved

629. **Lepistemon.**

Stamens arising directly from the corolla-tube:—

‡‡Corolla more or less campanulate; calyx-lobes never aristate, inflorescence never scorpioid; stamens not exserted [p. 59]

626. **Ipomœa.**

‡‡Corolla more or less hypocrateriform; calyx-lobes aristate or if obtuse the inflorescence scorpioid; stamens exserted:—[p.58]

Flowers rather small, pink, slightly irregular

627. **Quamoclit.**

Flowers large, white or purple, never pink, quite regular

628. **Calonyction.**

**Fruit indehiscent, woody or mealy or fleshy:—[p. 58]

Fruit woody; stigmas elliptic-oblong; corolla hypocrateriform

630. **Rivea.**

Fruit mealy or fleshy; stigmas globose; corolla not, or very rarely, hypocrateriform:—

Sepals large, orbicular, accrescent, mucilaginous, ultimately completely enveloping the fruit

631. **Stictocardia.**

Sepals small, ovate, or narrow-oblong, leathery, ultimately dry, not enlarging so as to envelop the fruit:—

Ovary 4-celled

632. **Argyreia.**

Ovary 2-celled

633. **Lettsomia.**

¶Perianth single:—[p. 49]

Leaves with parallel nervation and a large stem-clasping leaf-sheath; perianth represented by 2 lodicules

1124. **Melocanna.**

Leaves with reticulate nervation, leaf-sheath absent or minute:—

††Leaves with stipules:—[p. 60]

Stipules transformed into prickles ...184. **Zizyphus.**

Stipules membranous or herbaceous:—

***Stipules connate on both sides in an ochrea clasping the stem within the petiole of its leaf [p. 60] ....787. **Polygonum.**

***Stipules lateral, free :—[p. 59]

Fruit a small drupe with hard endocarp 854. **Trema.**

Fruit a dry nut, expanded into a flat obovate or orbicular reticulate wing :—

Leaves serrate ; cotyledons flat 851. **Ulmus.**

Leaves entire ; cotyledons folded 852. **Holoptelea.**

††Leaves without any stipules :—[p. 59]

Perianth-lobes valvate ....172. **Cansjera.**

Perianth-lobes imbricate :—

Stems twining ; perianth-lobes connate below 785. **Basella.**

Stems erect :—

Perianth-lobes membranous or herbaceous :—

Perianth-lobes connate below :—

Leaves fleshy, linear, terete or flattish ; embryo spiral ....778. **Suæda.**

Leaves herbaceous, flat ; embryo annular 780. **Beta.**

Perianth-lobes free :—

Flowers all similar......779. **Chenopodium.**

Flowers polygamous ....782. **Atriplex.**

Perianth-lobes scarious, free ; flowers 3-nate, the outer pair reduced to crested scales 769. **Digera.**

§Leaves opposite (in *Trichodesma* alternate above) or whorled :—[p. 49]

‡‡Perianth single, petals absent :—[p. 61]

Sepals free, imbricate ; styles 3 or more :—

Ovary 1-celled ....66. **Stellaria.**

Ovary 3–5-celled ....383. **Mollugo.**

Sepals or perianth-lobes connate below in a gamophyllous calyx or perianth-tube :—

Lobes of calyx imbricate above ......382. **Trianthema.**

Lobes of calyx or perianth valvate :—

Lobes of perianth with a tuft of hairs on their face ; trees ; ovules few (2–3) on a free central placenta ....810. **Santalum.**

Lobes of calyx naked on the face ; ovules very many on axial placentas :—

Herbs ; calyx membranous ......342. **Ammannia.**

Trees with firm calyx ; flowers polygamous 346. **Crypteronia.**

‡‡Perianth double, petals present :—[p. 60]

Petals free :—

Sepals free :—

Ovary 2- or more-celled ....74. **Bergia.**

Ovary 1-celled :

Styles free :—

Stipules absent ....66. **Stellaria.**

Stipules present, scarious ....67. **Spergula.**

Styles combined :—

Sepals not keeled :—

Leaves ovate-cordate ; stipules inconspicuous 68. **Drymaria.**

Leaves linear ; stipules scarious 70. **Polycarpæa.**

Sepals keeled ; leaves linear or spathulate ; stipules scarious ....69. **Polycarpon.**

Sepals connate below :—

Calyx-tube very short ; ovary superior :—

Fruit a drupe ; seeds without arillus :—

Calyx-lobes small, valvate ....203*. **Bouea.**

Calyx-lobes large, imbricate, orbicular 177. **Elæodendron.**

Fruit a dehiscent capsule ; seeds arillate ; calyx-lobes large, imbricate, orbicular 178. **Lophopetalum.**

Calyx-tube longer than the acute valvular lobes ; ovary inferior or enclosed in the calyx-tube :—

Style simple..........................342. **Ammannia.**

Styles two, free ....313. **Vahlia.**

Petals united in a gamophyllous corolla, or if free (*Loranthus* sometimes) the stamens epipetalous :—

††Ovary inferior :—[p. 65]

Stipules 0 ; corolla-lobes valvate :—

Stamens opposite corolla-lobes ...808. **Loranthus.**

Stamens alternate with corolla-lobes 506. **Campanumœa.**

Stipules present interpetiolar or if 0 (*Rubia*) the leaves 4 in a whorl :—

**Ovules many or, if few, at least more than one in each cell :—[p. 63]

¶Fruit dry, dehiscent, or if indehiscent separating into 2 several-seeded cocci :—[p. 63]

Flowers in dense globular heads; corolla funnel-shaped; stigma simple, far-exserted :—

Ovaries confluent; fruits forming a globose solid mass; corolla-lobes imbricate in bud; heads not bracteate; trees 403. **Anthocephalus.**

Ovaries free or nearly so; fruits quite separate, capsular; corolla-lobes valvate in bud :—

Flowers intermixed with paleaceous bracteoles; trees :—

Calyx-limb 5-toothed; heads with or without bracts ....404. **Adina.**

Calyx-limb entire; heads with 2 wide bracts ....405. **Stephegyne.**

Flowers not mixed with bracteoles; climbers with hooked peduncles 406. **Uncaria.**

Flowers axillary, solitary or fascicled, or in axillary or terminal cymes, racemes or panicles, never in dense globose heads :—

Corolla-lobes twisted in bud; fruit capsular, 2-celled; seeds angular, but not winged; flowers in panicles; trees or shrubs 407. **Wendlandia.**

Corolla-lobes valvate in bud :—

Trees; flowers with leafy bracts, in panicled spikes; fruits capsular, 2-celled; seeds winged ......408. **Hymenodictyon.**

Herbs; flowers solitary or fascicled, axillary, or in axillary or terminal cymes :—

Fruit oblong, subglobose, or orbicular :—

Corolla-lobes 2–3-toothed; stipules entire.....................409. **Dentella.**

Corolla-lobes quite entire; stipules bristly..............411. **Oldenlandia.**

Fruit broadly didymously obcordate with 2 compressed spreading lobes 413. **Ophiorrhiza.**

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¶Fruit fleshy or leathery, a berry, or drupe-like with 2 or more many-seeded pyrenes; seeds not winged; shrubs or trees:—[p. 62]

Corolla valvate; seeds many, small, angled:—

Inflorescence lax; fruit a berry:—

Inflorescence terminal; one calyx-lobe usually leaf-like ....414. **Mussænda.**

Inflorescence axillary; calyx equally 4–5-lobed ....415. **Adenosacme.**

Inflorescence subcapitate; calyx with 5 rigid lobes; fruit a drupe with 2 many-seeded pyrenes............416. **Myrioneuron.**

Corolla imbricate or contorted:—

Stamens inserted at base of corolla-tube; lobes of corolla imbricate; seeds small, cotyledons minute; inflorescence terminal 417. **Hamelia.**

Stamens inserted at or near mouth or corolla-tube; lobes of corolla contorted; seeds large, cotyledons often leafy; inflorescence axillary:—

Ovary 1-celled; seeds many; stigma fusiform ....418. **Gardenia.**

Ovary 2-celled:—

Stigma fusiform:—

Seeds many...............419. **Randia.**

Seeds few ....423. **Webera.**

Style-arms two; seeds few:—

Flowers sessile; anthers hirsute, subincluded ....421. **Hyptianthera.**

Flowers usually pedicelled; anthers glabrous, exserted 422. **Diplospora.**

**Ovules solitary in each cell:—[p. 61]

†Corolla-lobes contorted in bud; stipules interpetiolar solitary; shrubs or small trees:—[p. 64]

‡‡Flowers in large corymbs; stigma fusiform exserted:—[p. 64]

*Style short, pubescent; stigma stout [p. 64] 423. **Webera § Pseudixora.**

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*Style long, glabrous; stigma slender:— [p. 63]

Bracts membranous, the lower sheathing 424. **Pavetta.**

Bracts coriaceous, not sheathing 425. **Ixora.**

‡‡Flowers axillary, solitary or fascicled; style-arms 2, linear [p. 63]......426. **Coffea.**

†Corolla-lobes valvate in bud:—[p. 63]

Shrubs or small trees, usually erect; leaves stipulate:—

Flowers in dense heads; calyces confluent; fruits forming a globose or oblong solid mass; erect shrubs or small trees 427. **Morinda.**

Flowers free:—

Erect shrubs or small trees:—

Fruit drupaceous; styles not papillose:—

Style stout; stigma large; ovules pendulous; radicle superior; flowers axillary, fascicled:—

Ovary 2-celled ...428. **Canthium.**

Ovary 3–5-celled 429. **Vangueria.**

Style slender, stigma divided; ovules erect; radicle inferior:—

Flowers in terminal cymes; calyx-limb shortly 4–5-toothed; style-arms 2 ....430. **Psychotria.**

Flowers in axillary fascicles; calyx-tube deeply 3–6-fid; style-arms 3–9 ....431. **Lasianthus.**

Fruit capsular; capsule 5-valved at apex; style 5-fid, papillose; flowers densely panicled ...432. **Hamiltonia.**

Twining fœtid shrubs; styles 2, capillary, twisted, papillose; fruit of 2 dorsally-compressed, 1-seeded pyrenes; flowers panicled........................433. **Pæderia.**

Herbs; leaves whorled with stipules replaced by leaves; fruit of 2 coriaceous or fleshy indehiscent lobes ....437. **Rubia.**

††Ovary superior :—[p. 61]

Stamens opposite corolla-lobes :—

Herbs ; placentas free-central ; ovules numerous .. 515. **Anagallis.**

Trees ; placentas axial ; ovules solitary in each loculus of ovary ....521. **Sarcosperma.**

Stamens alternate with corolla-lobes ; placentas parietal or axial, never free-central :—

*Carpels free and only the styles united (if carpels united in flower the fruit of two free follicles) ; style more or less enlarged near the top with its stigmatic surface below the tip ; fruit of 2, rarely 1, free follicles, rarely of 2 drupes :—[p. 68]

†Pollen aggregated in solitary or paired masses (pollinia) in each anther-cell ; apex of style dilated into a plane or beaked disk with a stigmatic border bearing 5 glands (corpuscles), to which the pollinia are attached in pairs or fours ; fruit of 2 free follicles :—[p. 66]

Corona of 5 short, thick scales adnate to the corolla and separate from the filaments ; seeds with a coma :—

Corolla large, funnel-shaped, the lobes overlapping ....564. **Cryptostegia.**

Corolla small, rotate :—

Lobes of corolla overlapping 565. **Cryptolepis.**

Lobes of corolla valvate 566. **Hemidesmus.**

Corona of 5 filiform or subulate scales closely adjacent or adnate to the filaments :—

Filaments with no interposed glands ; seeds without coma ....567. **Finlaysonia.**

Filaments with interposed teeth or glands ; seeds with a coma :—

Cymes short, sessile ; corolla-lobes short, ovate ; follicles smooth 568. **Streptocaulon.**

Cymes loosely panicled ; corolla-lobes lanceolate ; follicles with many longitudinal membranous wings ...569. **Myriopteron.**

†Pollen granular; stigma annular or interrupted below the smooth, non-stigmatic entire or 2-fid tip of the style:—[p. 65]

Anthers free from the stigma, always included within corolla, the anther-cells with rounded bases:—

Calyx not glandular within:—

Fruit indehiscent, drupaceous; seeds few, without wings or coma:—

Ripe carpels 1-seeded and more or less united below; corolla-lobes overlapping to the left ....547. **Rauwolfia.**

Ripe carpels 1–2-seeded, free, one carpel sometimes abortive; corolla-lobes overlapping to the right 548. **Kopsia.**

Fruit dehiscent, of two free, slender, several-seeded follicles; corolla-lobes overlapping to the left:—

Ovules in each carpel 6 or more in only 2 rows; seeds subcylindric, truncate at both ends; leaves opposite; *stigma plumose* ....549. **Vinca.**

Ovules very many in several rows in each carpel; seeds ciliate at both ends; leaves whorled 550. **Alstonia.**

Calyx glandular within; fruit follicular:—

Follicles few-seeded coriaceous, sometimes hardly dehiscent; seeds embedded in pulp, without wings or coma; corolla-lobes overlapping to the left 551. **Tabernæmontana.**

Follicles many-seeded, slender, woody; seeds not embedded in pulp, tipped with a deciduous coma; corolla-lobes overlapping to the right ...552. **Holarrhena.**

Anthers conniving in a cone round the top of the style and attached to it by a point on the connective, the anther-cells produced downwards into a subulate empty spur; carpels rarely (*Vallaris*, *Parsonsia*) connate throughout in flower; fruit always of 2 free follicles; seeds always with a coma at one or at both ends:—

Anthers more or less exserted; corolla rotate or salver-shaped; leaves opposite:—

Mouth of corolla with a ring of scales; corolla either rotate or salver-shaped, lobes overlapping to the left; carpels free except at the styles; erect shrubs or small trees ....553. **Wrightia.**

Mouth of corolla naked; carpels connate or subconnate in flower; climbing shrubs:—

Corolla rotate, lobes overlapping to the right; connective thickened at the back 554. **Vallaris.**

Corolla salver-shaped, lobes subvalvate; connective not thickened 555. **Parsonsia.**

Anthers included; corolla-lobes overlapping to the right:—

Mouth of corolla with a ring of scales; corolla funnel-shaped:—

Erect shrubs; lobes of corolla not tailed; follicles erect; leaves whorled 556. **Nerium.**

Spreading or climbing shrubs; follicles spreading; leaves opposite:—

Lobes of corolla tailed 557. **Strophanthus.**

Lobes of corolla not tailed 558. **Roupellia.**

Mouth of corolla naked; leaves opposite:—

Corolla funnel-shaped, very large, 3-5 in. long; calyx with leafy segments 559. **Beaumontia.**

Corolla salver-shaped:—

¶Corolla very large, 2-3 in. wide, lobes sharply twisted to the left [p. 68]...........560. **Chonemorpha.**

¶Corolla medium or small, 1 in. wide or less:—[p. 67]

Lobes of medium corolla nearly straight; ovary completely or partially hidden in the disk; seeds not beaked ....561. **Aganosma.**

Lobes of the small corolla sharply twisted to the left in bud; seeds beaked:—

Ovary hidden in the cup-shaped disk; tips of corolla-lobes not deflected 562. **Anodendron.**

Ovary free from the 5-lobed disk; tips of corolla-lobes deflected.........563. **Ichnocarpus.**

*Carpels permanently united, stigma terminal:—[p. 65]

Throat of corolla with a ring of scales; corolla-lobes contorted and twisted to the left:—

Corolla large with a wide campanulate limb, scales of the throat ciliate; ovary 1-celled, with parietal placentas; fruit an ovate, echinate, 2-valved capsule 540. **Allamanda.**

Corolla medium hypocrateriform; ovary 2-celled with axial placentas; fruit a globose, smooth berry.........542. **Melodinus.**

Throat of corolla naked:—

†Fruit a large globose berry with seeds embedded in pulp; trees or erect or climbing woody shrubs:—[p. 69]

‡Corolla-lobes contorted:—[p. 69]

Corolla-lobes twisted to the left; ovary 1-celled with many parietal ovules; corolla hypocrateriform 541. **Willughbeia.**

Corolla-lobes twisted to the right; ovary more or less completely 2-celled:—

Corolla hypocrateriform; ovules rarely more than 4; seeds usually 2; armed shrubs [p. 67] ...543. **Carissa.

Corolla long, tubular; ovules and seeds very numerous; unarmed trees, shrubs, or climbers often epiphytic [p. 68]......................594. **Fagræa.

‡Corolla-lobes valvate; leaves usually 3–5-nerved; trees, or shrubs climbing with short, hooked tendrils [p. 68]
595. **Strychnos.**

†Fruit a capsule, or if indehiscent small and of separating nutlets, or a dry or nearly dry drupe:—[p. 68]

Fruit a capsule; herbs:—

Corolla-lobes valvate, capsule 2-valved
591. **Mitreola.**

Corolla-lobes contorted:—

Capsule septicidally 2-valved:—

Ovary and capsule completely 2-celled ....596. **Exacum.**

Ovary and capsule 1-celled or imperfectly 2-celled
597. **Erythræa.**

Capsule 3-valved ....602. **Phlox.**

Fruit indehiscent, dry, or nearly so; or of separating nutlets:—

Corolla-lobes contorted, leaves opposite only below; fruit of 4 dry nutlets; herbs
612. **Trichodesma.**

Corolla-lobes imbricate; fruit a small drupe:—

Cymes panicled; drupe included in a bladdery calyx; large trees
725. **Tectona.**

Cymes capitate, with large involucrant bracts; large climbers
733. **Sphenodesma.**

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Leaves 0; parasitic twining herbs ....802. **Cassytha.**

Leaves present, or if no proper leaves (*Asparagus*), then their place taken by slender leaf-like modified branches (cladodes):—

Flowers in simple or branched spikes (spadices) subtended by large, much modified bracts (spathes):—

Perianth-segments conspicuous, rigid, in two dissimilar series of 3 each:—

Leaves pinnatisect, segments with flabellate nerves; flowers polygamous (usually monœcious); medium palms 987. **Wallichia.**

Leaves orbicular, flabelliform, plicate, lobes with induplicate sides and parallel nerves; flowers all 2-sexual:—

Stigma in fruit basal; lofty palms ....982. **Corypha.**

Stigma in fruit terminal; small palms...............983. **Licuala.**

Perianth-segments small, herbaceous, 6 similar:—

Erect prickly herbs of wet places ....1012. **Lasia.**

Scandent unarmed epiphytes ....1011. **Pothos.**

Flowers variously arranged, but if in spikes these not subtended by spathes:—

*Leaves compound, with 3 or more leaflets:—[p. 71]

Leaves digitately 5–7-foliolate ....51. **Gynandropsis.**

Leaves pinnate:—

Leaflets 3, gland-dotted, a lateral pair with a shortly petioluled terminal leaflet ....140. **Triphasia.**

Leaflets more than 3, not gland-dotted:—

Leaves odd-pinnate:—

Style simple; ovary 5-celled; fruit a 5-valved capsule with many winged seeds ....166. **Cedrela.**

Style 3; ovary 1-celled; fruit a dry drupe with a firm 1-seeded stone...210. **Rhus.**

Leaves even-pinnate:—

Seeds without an arillus:—

Cocci of fruit at first united, ultimately spontaneously separating ....192. **Sapindus.**

Cocci of fruit deeply divided to nearly their base, but not spontaneously separating ....194. **Aphania.**

Seeds arillate:—

¶Fruit not deeply lobed, usually more than 1 cell developed [p. 71]..........................195. **Schleichera.**

¶ Fruit sulcately lobed, usually only 1 coccus developed [p. 70] ....196. **Nephelium.**

*Leaves simple, or if compound only 1-foliolate, or if absent replaced functionally by cladodes :—[p. 70]

†Venation of leaves reticulate :—[p. 73]

‡Stamens adnate to the corolla :—[p. 72]

Ovary inferior :—

Leaves radical, 3-partite; perianth 2-seriately 6-lobed; stamens opposite corolla-lobes; ovary 1-celled; ovules many on 3 parietal placentas ....957. **Tacca.**

Leaves opposite :—

Stamens opposite the petals or corolla-lobes; ovary 1-celled, 1-ovuled...............................808. **Loranthus.**

Stamens alternate with the petals or corolla-lobes :—

Leaves without stipules; ovary 5–6-celled, ovules many on axial placentas ....506. **Campanumœa.**

Leaves with interfoliar stipules :—

Lobes of corolla valvate :—

Ovules several in each loculus of ovary 415. **Adenosacme.**

Ovules solitary in each loculus of ovary :—

Flowers in dense heads with confluent calyces 427. **Morinda.**

Flowers free :—

Style stout, stigma large; ovules pendulous; flowers in axillary fascicles...429. **Vangueria.**

Style slender, stigma divided; ovules erect :—

Flowers in terminal cymes; calyx-limb shortly 4–5-toothed; style-arms 2 430. **Psychotria.**

Flowers in axillary fascicles; calyx-tube deeply 3–6-fid; style-arms 3–9 431. **Lasianthus.**

Lobes of corolla contorted; ovules several in each loculus of ovary ....418. **Gardenia.**

Ovary superior :—

§Leaves opposite; stamens alternate with petals or corolla-lobes :—[p. 72]

Cymes panicled; drupe included in the accrescent calyx; lofty trees ....725. **Tectona.**

Cymes capitate, 3–9-flowered, with large involucrant bracts; large climbers ....732. **Symphorema.**

§Leaves alternate :—[p. 71]

Stamens opposite petals or corolla-lobes :—

Corolla-lobes as many as calyx-segments 523. **Achras.**

Corolla-lobes three times as many as calyx-segments 526. **Mimusops.**

Stamens alternate with petals or corolla-lobes :—

Style twice 2-partite ; ovary 4-celled, each cell 1-ovuled ; fruit a 1–4-seeded drupe ....604. **Cordia.**

Style simple, stigma undivided; ovary 2-celled, each cell many-ovuled ; fruit a many-seeded fleshy berry :—

Anthers opening introrsely by longitudinal slits, their tips empty ; leaves pinnatisect 634. **Lycopersicum.**

Anthers opening by apical pores or short apical slits ; leaves entire, lobed or pinnatifid 635. **Solanum.**

‡Stamens, even when corolla present, not adnate to the petals :—[p. 71]

Perianth-segments of 6 sepals and 6 petals all free ; stamens hypogynous ; armed shrubs with leaves fascicled in the axils of 3–5-partite spines ....32. **Berberis.**

Perianth-segments fewer than 12 ; unarmed herbs, shrubs, or trees :—

Leaves opposite :—

Sepals free ; styles 3 ; stamens arising from thalamus 66. **Stellaria.**

Sepals connate in a calyx-tube ; style simple ; stamens arising from calyx :—

Calyx-lobes imbricate ; leaves strongly 3-nerved from base ....340. **Sonerila.**

Calyx-lobes valvate ; leaves penninerved 342. **Ammannia.**

Leaves alternate :—

¶Perianth double, of sepals and petals :—[p. 73]

Sepals quite free :—

Sepals and petals 4 ; petals without scales at the base ; herbs ....50. **Cleome.**

Sepals and petals 5 ; petals with short woolly incurved basal scales ; trees ....194. **Aphania.**

Sepals connate in a small gamophyllous calyx :—

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Stamens alternate with petals :—

Leaves gland-dotted ....144. **Atalantia.**

Leaves not gland-dotted ....207. **Semecarpus.**

Stamens opposite petals ....355. **Homalium.**

¶Perianth single, of sepals only; leaves stipulate :—[p. 72]

Stipules lateral, free; trees ....852. **Holoptelea.**

Stipules ochreate; herbs :—

Stigmas capitellate......................787. **Polygonum.**

Stigmas fimbriate ....788. **Rumex.**

†Venation of leaves parallel :—[p. 71]

§§Ovary inferior :—[p. 74]

Flowers more or less sunk in the rachis, all the flowers of the inflorescence confluent with the accrescent rachis and bracts in a fleshy cone-like fruit..............................945. **Ananas.**

Flowers all free :—

Ovary 1-celled; ovules many :—

Outer perianth-segments calycine, inner petaloid; placentas intruded so that the ovarian chamber is almost 6-celled; submerged aquatic herbs 890. **Ottelia.**

Outer perianth-segments firm like the inner, both subherbaceous or lurid; placentas 3 parietal; leaves radical; flowers in involucrate umbels on leafless scapes 957. **Tacca.**

Ovary 3-celled; outer perianth-segments white, pink, or yellow, petaloid like the inner :—

Leaves large, thick, and fleshy, densely clustered on a rootstock or a short, simple stem, spiny at tip and usually armed along the edge; scape long, terminal, simple or branching towards apex :—

Inflorescence simple spicate, or compound thyrsoid; stamens longer than perianth; filaments filiform or flattened at the base; style filiform.........950. **Agave.**

Inflorescence laxly paniculate; stamens shorter than perianth; filaments thickened at base; style thickened in the middle ....951. **Furcrœa.**

Leaves thin and flat or, if somewhat fleshy, unarmed :—

‡‡Rootstock tuberous; leaves strongly nerved, flat or plicate; flowers spicate or racemose, very rarely subumbellate; perianth yellow :—[p. 74]

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Fruit opening at top as a circumscissile or 3-valved capsule ; ovary not produced above the crown into a stipe supporting the perianth............952. **Hypoxis.**

Fruit indehiscent ; often the ovary produced into a stipe between the crown and the base of the perianth-lobes.......................................953. **Curculigo.**

‡‡Rootstock a tunicated bulb ; leaves not strongly nerved, flat, smooth, thinly fleshy ; flowers at the apex of a scape usually umbellate, occasionally solitary ; perianth white or pink :—[p. 73]

Scapes 1-flowered ....954. **Zephyranthes.**

Scapes umbellate ....955. **Crinum.**

§§Ovary superior :—[p. 73]

*Flowers arranged in spikelets with imbricating glumes ; ovary 1-locular and ovule solitary ; leaves with stem-clasping sheaths and a ligule at the junction of leaf-sheath and blade ; perianth if present reduced to a 2-nerved palea and 2 lodicules ; fruit a grain with seed-coats adherent to the pericarp :—[p. 75]

Herbaceous grasses ; blades never transversely veined nor articulate on the leaf-sheaths :—

Glumes I and II minute or setaceous ; III and IV chartaceous ....1058. **Oryza.**

Glumes I and II absent ; III and IV membranous :—

Glumes broad, the outmost not awned
1059. **Leersia.**

Glumes narrow, the outmost awned
1060. **Hygrorhiza.**

Shrubby or tree-like grasses ; blades transversely veined and articulate on the leaf-sheaths :—

Pericarp thin and membranous............1116. **Bambusa.**

Pericarp fleshy or crustaceous :—

†Paleæ 2-keeled :—[p. 75]

Spikelets 2–more-flowered, only one flower usually fertile ; generally spikelets capitate on the branches of the panicle :—

Ovary hirsute at top ; pericarp crustaceous
1119. **Dendrocalamus.**

Ovary glabrous at top ; pericarp fleshy
1120. **Melocalamus.**

Spikelets 1-flowered :—

¶Spikelets loosely spicate on the branches of the panicle [p. 75] ....1121. **Teinostachyum.**

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¶Spikelets crowded in globose heads [p. 74]
1122. **Cephalostachyum.**

†Paleæ 0, or, if present, glume-like :—[p. 74]

Spikelets very minute; fruit small...1123. **Dinochloa.**

Spikelets conspicuous; fruit very large
1124. **Melocanna.**

*Flowers not enclosed in imbricating glumes; ovary rarely 1-locular and never 1-ovuled; leaves without a ligule; perianth always present, and either calycine or petaloid or both; fruit never a grain :—[p. 74]

Carpels free :—

Flowers in spikes; perianth-segments petaloid, 1-seriate, irregular in shape and 1–3 in number; fruit of 3 follicles
1019. **Aponogeton.**

Flowers in umbellate or panicled whorls; perianth-segments regular 2-seriate, 3 outer herbaceous, 3 inner petaloid; fruit of 6 or more achenes :—

Flowers all 2-sexual..........................1015. **Alisma.**

Flowers polygamous ....1016. **Limnophyton.**

Carpels connate in a 3-celled, rarely 2-celled ovary :—

Perianth 2-seriate, the 3 outer segments calycine, the 3 inner petaloid :—

Petals connate below in a tube............977. **Cyanotis.**

Petals free :—

Capsule 3-locular ....878. **Forrestia.**

Capsule 2-locular...........................979. **Floscopa.**

Perianth of 6 1-seriate segments, or if in 2 series of 3 each the segments of both series similar :—

Perianth-segments small calycine :—

Fruit a 3-valved capsule; grassy herbs with slender linear or terete leaves.......................981. **Juncus.**

Fruit indehiscent; climbing shrubs with flattened leaves ending in a tendril............980. **Flagellaria.**

Perianth-segments all petaloid :—

‡Perianth-segments connate below in a distinct tube; stamens adnate to the corolla :—[p. 76]

**Perianth-tube narrow, campanulate, lobes narrow, as long as the tube; fruit indehiscent; stout herbs or shrubs; flowers spicate :—[p. 76]

††Pericarp membranous, deliquescent; seeds ripening outside the pericarp; each cell of ovary 1-ovuled [p. 76].........947. **Sansevieria.**

††Pericarp persistent, firmly coriaceous :—[p. 75]

Each cell of the ovary 1-ovuled
962. **Dracæna.**

Each cell of the ovary many-ovuled
963. **Cordyline.**

**Perianth-tube wide, funnel-shaped, lobes broad, longer than the tube ; fruit a loculicidal capsule ; delicate leafy herbs ; flowers panicled [p. 75]
972. **Hemerocallis.**

‡Perianth-segments quite free or only faintly united at the very base :—[p. 75]

§Terrestrial herbs or shrubs ; inflorescence varied, axillary or terminal, but never in a one-leafed scape :—[p. 77]

Shrubs with perennial epigæal stems ; leaves 0 ; main branches with many clustered leaf-like cladodes, fruit a berry ....960. **Asparagus.**

Herbs with annual stems or scapes rising from perennial rootstocks, corms, or bulbs, rarely (*Asphodelus*) wholly annual :—

¶Underground perennial stem large in proportion to the roots :—[p. 77]

Perennial stem a creeping rootstock ; annual aerial stem erect, leafy ; leaves broad ; fruit a berry ......964. **Disporum.**

Perennial stem compact, not creeping ; fruit a loculicidal capsule :—

Aerial annual stem climbing, leafy ; leaves broad with tendril-like tips ; perianth large, showy ; rootstock tuber-like, irregular, naked ......965. **Gloriosa.**

Aerial annual stems or scapes erect ; leaves narrow ; rootstock a globose coated corm or bulb :—

Perennial stem a solid corm with brown sheaths ; annual stem leafy with scattered linear or ensiform leaves ; flowers solitary or corymbose
966. **Iphigenia.**

Perennial stem a tunicated bulb ; annual scape simple, naked ; leaves radical :—

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Flowers racemose on the scape, not surrounded by an involucre of bracts:—

Seeds subglobose; perianth segments spreading stellately 967. **Scilla.**

Seeds flattened; perianth segments ascending campanulately 968. **Urginea.**

Flowers umbellate or capitate at the top of the scape, at first enclosed in a spathe-like involucre of membranous bracts........................969. **Allium.**

¶Underground perennial stem very small or (*Asphodelus*) sometimes none; root-fibres large, numerous, usually some or all fleshy or tuberous; leaves radical; fruit a loculicidal capsule:—[p. 76]

Each cell of the ovary 2-ovuled; capsule 3-quetrous; leaves semi-terete; plant annual ....970. **Asphodelus.**

Each cell of the ovary 4–more-ovuled; capsule deeply 3-lobed, the lobes flattened; leaves flat ....971. **Chlorophytum.**

§Aquatic, erect, or floating herbs; inflorescence racemose or spicate, terminating a 1-leafed scape [p. 76] ....973. **Monochoria.**

Class VII. HEPTANDRIA.

*Leaves compound, even-pinnate:—[p. 78]

†Sepals small, free; ovary syncarpous; fruit composed of 1 or more cocci:—[p. 78]

Seeds without an arillus....................................194. **Aphania.**

Seeds arillate:—

Fruit not deeply lobed, usually more than 1 cell developed 195. **Schleichera.**

Fruit sulcately lobed, usually only 1 coccus developed 196. **Nephelium.**

†Sepals connate in a short-tubed calyx; ovary of 1 carpel; fruit a pod:—[p. 77]
Petals present ....278. **Cassia.**
Petals 0 ....282. **Saraca.**
*Leaves simple:—[p. 77]
Leaves opposite:—
Petals free or 0; small herbs ....66. **Stellaria.**
Petals united in a gamophyllous corolla:—
Leaves without stipules; large climbers ......732. **Symphorema.**
Leaves with interpetiolar stipules:—
Flowers aggregated in heads; corolla-lobes valvate 427. **Morinda.**
Flowers free; corolla-lobes contorted...............418. **Gardenia.**
Leaves alternate:—
Leaves without leaf-sheath or ligule:—
Perianth double, of sepals and petals:—
Petals free:—
Sepals not united; stamens arising below the ovary, not opposite the petals, which have each a basal scale 194. **Aphania.**
Sepals united in a gamophyllous calyx; stamens arising from calyx-tube opposite the petals ....355. **Homalium.**
Petals connate in a gamophyllous corolla ....604. **Cordia.**
Perianth single, of sepals only; leaves stipulate:—
Stipules connate in a stem-clasping ochrea ...787. **Polygonum.**
Stipules lateral, free ....852. **Holoptelea.**
Leaves with large stem-clasping leaf-sheath and a ligule at junction of sheath and blade ....1124. **Melocanna.**

Class VIII. OCTANDRIA.

*Leaves compound:—[p. 79]
†Leaves dotted with pellucid glands:—[p. 79]
Style short, persistent ....136. **Glycosmis.**
Style articulate at top of ovary, deciduous:—
Leaves odd-pinnate with all leaflets alternate; unarmed 137. **Clausena.**
Leaves 3-foliolate or odd-pinnate with leaflets opposite except the terminal; armed:—

Calyx distinctly 4–5-lobed ; leaflets usually 5......141. **Limonia.**

Calyx cupular, margin entire or obscurely 4–6-lobed ; leaflets always 3 ....142. **Luvunga.**

†Leaves not gland-dotted :—[p. 78]

Leaves odd-pinnate with leaflets opposite except the terminal, or 3-nate :—

Trees or shrubs ; tendrils 0 :—

Leaves simply pinnate ; flowers polygamous :—

Ovary 1-celled (in this genus the flowers are mostly monœcious or diœcious) ....209. **Odina.**

Ovary 4–5-celled ; flowers always polygamous 212. **Spondias.**

Leaves digitately 3-foliolate ....191. **Allophylus.**

Herbs with slender climbing habit, with twice ternate leaves, and tendrils ....190. **Cardiospermum.**

Leaves even-pinnate :—

Leaves simply pinnate ; trees :—

Leaflets 4 or more than 4 ; sepals free ; ovary syncarpous ; fruit of 1–3 indehiscent cocci :—

Seeds without an arillus :—

Cocci of fruit at first united, at length spontaneously separating ....192. **Sapindus.**

Cocci of fruit deeply divided to nearly their base, but not spontaneously separating :—

Cocci oblong ; testa of seed membranous ; scales of the petals hooded and crested ....193. **Erioglossum.**

Cocci ellipsoid or sub-3-gonuus ; testa cartilaginous ; scales of the petals not crested ....194. **Aphania.**

Seeds arillate :—

Fruit not deeply lobed, usually more than one cell developed ....195. **Schleichera.**

Fruit sulcately lobed, usually only one coccus developed 196. **Nephelium.**

Leaflets 2 only, carpel solitary free, fruit a subindehiscent pod 281. **Hardwickia.**

†Leaves twice evenly or digitately pinnate ; bristly and prickly herbs ....300. **Mimosa.**

*Leaves simple ; if compound, 1-foliolate :—[p. 78]

¶Leaves alternate :—[p. 81]

§Ovary inferior :—[p. 80]

‡‡Aquatic herbs ; ovules many axial in several rows in each cell [p. 80] ....351 **Jussiæa.**

‡‡Terrestrial shrubs or trees; ovules solitary from apex of each cell:—[p. 79]

Flowers in panicled umbels; leaves stipulate 399. **Trevesia.**

Flowers in axillary cymes; stipules 0 ....401. **Marlea.**

§Ovary superior:—[p. 79]

Venation of leaves parallel; flowers in bracteate whorls; carpels and follicles apocarpous..............................1018. **Butomopsis.**

Venation of leaves reticulate; flowers never in bracteate whorls:—

**Perianth 2-seriate, of calyx and corolla:—[p. 81]

Stamens opposite the petals or lobes of corolla:—

Petals free; styles 2–5 ....355. **Homalium.**

Petals united in a gamophyllous corolla; style simple 526. **Mimusops.**

Stamens alternate with or more numerous than petals or corolla-lobes:—

Petals united in a gamophyllous corolla.........604. **Cordia.**

Petals free:—

Small herbs, with glandular hairs; styles 2–5, free, crowning a 1-celled ovary....................316. **Drosera.**

Trees or shrubs, never with glandular hairs:—

Sepals quite free:—

Leaves scattered; ovary 1-celled more or less stipitate; petals without scales:—

Sepals and petals 4 each, regular; stamens on thalamus free from petals............52. **Capparis.**

Sepals and petals usually 5 each, irregular to some extent; only 2 stamens on thalamus, with 6 adnate to the petals 64. **Xanthophyllum.**

Leaves clustered in false whorls; ovary 2–3-celled; petals with basal scales ....194. **Aphania.**

Sepals connate in a gamophyllous calyx:—

††Leaf dotted with pellucid glands:—[p. 81]

Style short, persistent; (leaves usually with more than one leaflet) ....136. **Glycosmis.**

Style articulate at top of ovary, deciduous:—

Flowers polygamous; stem unarmed 135. **Acronychia.**

Flowers all hermaphrodite; armed with spines:—

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Anthers linear-oblong ; disk elongate
143. **Paramignya.**
Anthers ovate-cordate ; disk cup-shaped
144. **Atalantia.**
††Leaf not gland-dotted :—[p. 80]
Fruit a kidney-shaped nut resting on the enlarged fleshy pyriform disk and peduncle ; carpel solitary ....208. **Anacardium.**
Fruit a small nearly dry drupe with a crustaceous or bony stone ; carpels 5–6, only one developing
202. **Buchanania.**
**Perianth 1-seriate, petals absent :—[p. 80]
Perianth-segments free :—
Shrubs ; stipules 0..............................198. **Dodonæa.**
Herbs ; stipules connate in a membranous ochrea
787. **Polygonum.**
Perianth-segments united :—
Ovary with many parietal ovules ; fruit a capsule
354. **Casearia.**
Ovary with a solitary pendulous ovule ; fruit indehiscent :—
Stipules 2, lateral ; fruit with a flattened orbicular or obcordate wing ....852. **Holoptelea.**
Stipules 0 ; fruit ovoid ....804. **Wikstrœmia.**
¶Leaves opposite :—[p. 79]
Styles free :—
Sepals free ; carpels connate in a 1-celled ovary ; styles usually 3 ; petals free, sometimes absent ....66. **Stellaria.**
Sepals connate in a tubular or inflated calyx ; carpels 4, free or only slightly united below ; petals connate at base :—
Calyx shortly 4-fid..................................314. **Bryophyllum.**
Calyx deeply 4-partite ....315. **Kalanchoe.**
Style simple or styles connate :—
Perianth 1-seriate (leaves sometimes partly alternate)
804. **Wikstrœmia.**
Perianth 2-seriate, of calyx and corolla :—
Petals connate in a gamophyllous corolla :—
Ovary superior ; corolla-lobes imbricate ; stipules 0
732. **Symphorema.**
Ovary inferior ; corolla-lobes contorted ; stipules interpetiolar ....418. **Gardenia.**
Petals free :—

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Leaves dotted with pellucid glands (subopposite only) 135. **Acronychia.**

Leaves not gland-dotted, or if glandular the glands not pellucid :—

Sepals only 2, fewer than petals, large and much imbricate, herbs with fleshy stems and leaves............71. **Portulaca.**

Sepals 4–5, as many as petals, rarely (*Memecylon*) calyx truncate ; trees, shrubs, or, if herbs, not fleshy :—

Leaves 3-nerved from the base ; calyx-lobes slightly imbricate ....338. **Osbeckia.**

Leaves penninerved :—

Calyx-tube truncate ....341. **Memecylon.**

Calyx-lobes distinct, valvate :—

Leaves stipulate ; plants of mangrove swamps 319. **Rhizophora.**

Leaves without stipules ; inland plants :—

Ovary 1-locular ; climbing shrubs 327. **Combretum.**

Ovary 2-more-locular :—

Herbs of wet places ; petals small, flat 342. **Ammannia.**

Shrubs ; petals larger, corrugated 345. **Lawsonia.**

Class IX. ENNEANDRIA.

Leaves none ; parasitic twining herbs ; anthers dehiscing by valves 802. **Cassytha.**

Leaves present, always simple :—

*Leaves alternate or all radical :—[p. 83]

†Venation of leaves parallel ; leaves radical or mostly so ; aquatic more or less submerged herbs :—[p. 83]

Ovary inferior ; carpels united :—

Leaves all long and narrow ; fruit not winged ......888. **Blyxa.**

Leaves, at least some, ovate, petioled ; fruit winged 890. **Ottelia.**

Ovary superior ; carpels apocarpous :—

Fruit of indehiscent achenes :—

Receptacle flat ; flowers all hermaphrodite......1015. **Alisma.**

Receptacle globose ; flowers polygamous ...1017. **Sagittaria.**

Fruit of dehiscent follicles.......................1018. **Butomopsis.**

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†Venation of leaves reticulate; leaves never radical; terrestrial trees or shrubs :—[p. 82]

Leaves 2-lobed, more or less cleft at the tip, digitately nerved from the base ....279. **Bauhinia.**

Leaves not 2-lobed at tip; main-nerves pennate :—

Anthers opening by longitudinal slits :—

Flowers 3-merous; sepals free, 3; petals 6, 2-seriate; carpels several, each 6–8-ovuled ....10. **Sageræa.**

Flowers 5-merous; sepals connate below, 5; petals 5, 1-seriate; carpel solitary, ovule 1 ....208. **Anacardium.**

Anthers dehiscing by upturned flap-like valves :—

Anthers all 2-celled :—

Perianth-tube persistent; enclosing the fruit; its lobes 6, subequal ....794. **Cryptocarya.**

Perianth-tube altogether deciduous :—

Perianth-lobes 5, subequal; pedicels unthickened in fruit; staminodes ovate or cordate; leaves both alternate and opposite ....795. **Beilschmiedia.**

Perianth-lobes 6, the three outer much the shorter; pedicels much enlarged in fruit; staminodes minute or absent ....796. **Dehaasia.**

Anthers all 4-celled :—

Perianth in fruit with deciduous lobes but wholly or partly persistent tube ....797. **Cinnamomum § Camphora.**

Perianth in fruit altogether persistent :—

Lobes of perianth reflexed in fruit ....798. **Machilus.**

Lobes of perianth erect in fruit ....799. **Phœbe.**

*Leaves opposite or subopposite :—[p. 82]

Anthers dehiscing by upturned flap-like valves; trees :—

Anthers 2-celled; leaves alternate as well as opposite 795. **Beilschmiedia.**

Anthers 4-celled; leaves 3-nerved from base 797. **Cinnamomum § Malabathrum.**

Anthers not opening by valves :—

Petals connate in a corolla with contorted lobes; ovary inferior; style simple; shrubs or small trees ....418. **Gardenia.**

Petals free, or occasionally absent; ovary superior; styles free; herbs ....66. **Stellaria.**

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Class X. DECANDRIA.

*Leaves compound :—[p. 86]
Leaflets glandular-punctate :—
Style short persistent :—
Ovules 2 in each loculus of ovary........................153. **Bursera.**
Ovule solitary in each loculus of ovary; leaves sometimes 1-foliolate 136. **Glycosmis.**
Style articulate at top of ovary, deciduous :—
Ovules 1–2 in each loculus of ovary :—
Unarmed plants; leaves pinnate with leaflets alternate :—
Petals imbricate; cotyledons fleshy, plano-convex :—
Filaments dilated below ....137. **Clausena.**
Filaments linear-subulate........................138. **Murraya.**
Petals valvate; cotyledons leafy, corrugated; filaments linear-subulate.................................139. **Micromelum.**
Armed plants; leaves pinnate or 3-foliolate, with leaflets opposite except the terminal :—
Calyx distinctly 4–5-lobed; leaflets usually 5 or more, rarely 3 141. **Limonia.**
Calyx cupular with entire or obscurely 4–6-toothed margin; leaflets always 3 ....142. **Luvunga.**
Ovules more than 2 in each loculus of ovary; armed trees 145. **Feronia.**

Leaflets not glandular-punctate :—
†Leaves odd-pinnate :—[p. 85]
Leaves 3-pinnate...213. **Moringa.**
Leaves once-pinnate or 3-foliolate :—
Herbs; leaves 3-foliolate ....128. **Oxalis.**
Trees or shrubs; leaves simply pinnate :—
Leaflets alternate; fruit of 1–5 membranous samaras; flowers polygamous, only the male flowers 10-staminate 148. **Ailanthus.**
Leaflets opposite or subopposite :—
Sepals 5, free, imbricate; styles 5, distinct; fruit a berry 130. **Averrhoa.**
Sepals 5, rarely 4, connate below in a cupular calyx :—
‡Ovary 1-locular :—[p. 85]
§Ovule solitary; fruit a drupe :—[p. 85]
Ovule pendulous from a basal funicle......210. **Rhus.**
Ovule suspended from top or side of ovary :—

Style solitary ....211. **Tapiria.**
Styles 3 or 4 ....209. **Odina.**
§Ovules 2 or more from the ventral line of ovary; fruit a pod:—[p. 84]
Stigma terminal; pod moniliform ...275. **Sophora.**
Stigma oblique; pod turgid, fleshy, or coriaceous 276. **Ormosia.**
‡Ovary 2-more-locular:—[p. 84]
Ovules in each loculus solitary; styles 4 or 5 connivent above ....212. **Spondias.**
Ovules in each loculus 2; style simple:—
Fruit a fleshy indehiscent 1-seeded berry 161. **Walsura.**
Fruit a drupe with hard 1-seeded stones:—
Drupe 3-gonous, with a valvate epicarp; pyrenes 3 151. **Boswellia.**
Drupe globose, with a fleshy entire epicarp; pyrenes 5 or by abortion 1–3 ......152. **Garuga.**
†Leaves even-pinnate:—[p. 84]
Leaves simply pinnate:—
Styles 5, distinct; leaves sensitive; herbs......129. **Biophytum.**
Styles connate, or style solitary; leaves not sensitive:—
Leaves opposite; ovary 5–12-celled; herbs ...125. **Tribulus.**
Leaves alternate; trees or shrubs, rarely (*Cassia* sometimes) herbs:—
Ovary 2-more-celled:—
Leaflets 2; ovary 5-celled ....149. **Balanites.**
Leaflets 4 or more than 4; ovary 2–3-celled:—
Ovary 3-celled; ovules several in each cell; fruit a capsule with winged seeds ....167. **Chloroxylon.**
Ovary 2–3-celled; ovules solitary in each cell; fruit of 1–3 indehiscent cocci; seeds not winged:—
Seeds without arillus......................192. **Sapindus.**
Seeds arillate ....196. **Nephelium.**
Ovary 1-celled, of a single free carpel:—
Corolla of 5 imbricate petals:—
Anthers dehiscing by a terminal pore ......278. **Cassia.**
Anthers dehiscing longitudinally......280. **Cynometra.**
Corolla wanting; leaflets 2...............281. **Hardwickia.**
Leaves 2-pinnate:—
¶Flowers irregular; petals imbricate:—[p. 86]
Leaves with a short spinescent main-rachis, the 4–8 pinnæ

simulating a fasciculus of simply pinnate leaves; calyx-lobes subequal..286. **Parkinsonia.**

Leaves with a distinct main-rachis :—

Calyx-segments valvate :—

Calyx-lobes subequal, green ....287. **Poinciana.**

Calyx-lobes unequal, the four upper connate, the lower free, all coloured.................................288. **Colvillea.**

Calyx-segments imbricate, very unequal, the lowest large, boat-shaped and enclosing the others :—

Pod winged ....289. **Mezoneuron.**

Pod wingless ....290. **Cæsalpinia.**

¶Flowers regular; petals valvate :—[p. 85]

Anthers gland-tipped :—

Inflorescence elongated :—

Large tendril-bearing climbers; leaves with few leaflets; pod very long and wide; seeds huge; flowers sessile 292. **Entada.**

Trees or shrubs without tendrils; leaves with many leaflets; pods narrow :—

Flowers shortly stalked; leaflets fairly large, not contiguous, alternate on the secondary rachises; pods narrow at length contorted; unarmed trees 293. **Adenanthera.**

Flowers sessile; leaflets small, opposite; armed shrubs or small trees :—

Pod turgid with thick edible mesocarp; leaflets small not contiguous..............................294. **Prosopis.**

Pod thin coriaceous, at length contorted; leaflets minute, contiguous ....295. **Dichrostachys.**

Inflorescence capitate :—

Small aquatic or subaquatic herbs, with small thin pods opening early by the upper suture ....296. **Neptunia.**

Lofty trees, with large thick woody pods tardily dehiscent by both sutures.......................................297. **Xylia.**

Anthers not gland-tipped; shrubs or undershrubs with capitate flowers and thin coriaceous pods :—

Undershrubs; stigma clavate ....298. **Desmanthus.**

Large shrubs or small trees; stigma capitate 299. **Leucæna.**

*Leaves simple; or if compound (*Paramignya*) 1-foliolate :—[p. 84]

†Leaves alternate, or radical :—[p. 88]

‡Styles free :—[p. 87]

Leaves parallel-nerved, all radical tufted; carpels free, 6–7 1018. **Butomopsis.**

Leaves reticulate-veined, nerves digitate or penninerved; carpels connate, only the styles free :—

Leaves conspicuous :—

Shrubs, climbing with hooked tendrils; ovary inferior; styles 3; leaves clustered, penninerved, entire...85. **Ancistrocladus.**

Herbs; ovary superior; styles 5; leaves not clustered, palminerved, digitately lobed, lobes toothed...127. **Geranium.**

Leaves small, scale-like; erect shrubs; styles 3...73. **Tamarix.**

‡Styles connate, or style solitary :—[p. 86]

Perianth of 1 whorl only; shrubs or trees :—

Perianth-lobes with scales above the stamens; ovules solitary in each cell of the ovary; seeds 1–2; fruit a capsule 806. **Aquilaria.**

Perianth-lobes with no scales :—

Ovules many on parietal placentas; seeds numerous; fruit a capsule ....354. **Casearia.**

Ovules 2–3, pendulous from apex of ovary :—

Flowers in racemes or spikes ....326. **Terminalia.**

Flowers in heads...................................325. **Anogeissus.**

Perianth of 2 whorls, calyx and corolla :—

Petals connate in a gamophyllous corolla :—

Stamens not adnate to corolla-tube..............511. **Agapetes.**

Stamens adnate to corolla-tube ....530. **Styrax.**

Petals free :—

§Ovary superior :—[p. 88]

¶Flowers regular :—[p. 88]

Sepals distinct, valvate; ovary of several connate carpels:—

Petals glandular at base; fruit small, globose, prickly, indehiscent or of separable cocci......118. **Triumfetta.**

Petals not glandular at base; fruit a globose or elongated loculicidal capsule, prickly or not 119. **Corchorus.**

Sepals connate below in a gamophyllous calyx :—

*Leaves not gland-dotted; ovary of 1 carpel or if more than one (*Buchanania*) only one developed :—[p. 88]

Fruit a kidney-shaped nut resting on the enlarged fleshy peduncle and disk............208. **Anacardium.**

Fruit a small, nearly dry drupe derived from the solitary fertile member of the 5–6 carpellary whorl 202. **Buchanania.**

*Leaves gland-dotted ; ovary 2–more-celled [p. 87]
143. **Paramignya.**

¶Flowers irregular ; ovary of a single carpel :—[p. 87]
Leaves deeply 2-lobed ....279. **Bauhinia.**
Leaves not 2-lobed..........................277. **Dalhousiea.**

§Ovary inferior :—[p. 87]
Leaves large palmatifid ; flowers in panicled umbels ; ovary several-celled, cells each 1-ovuled ; calyx-limb truncate or faintly toothed..399. **Trevesia.**
Leaves entire, penninerved ; calyx-lobes valvate :—
Ovary 4–5-celled ; cells many-ovuled ; marsh herbs
351. **Jussiæa.**
Ovary 1-celled ; cells 2–5-ovuled ; shrubs in littoral swamps ....329. **Lumnitzera.**

†Leaves opposite :—[p. 86]
⊙Perianth 2-seriate ; a calyx and a corolla :—[p. 89]
Leaves stipulate :—
Trees or shrubs ; style simple :—
Species of mangrove swamps ; embryo without albumen, macropodous and germinating while the fruit is still on the tree ....320. **Ceriops.**
Species of inland forests ; embryo small, immersed in fleshy albumen, not germinating on the tree............323. **Carallia.**
Herbs ; styles free, 3–5, or if connate, stigma 3–8-fid ; fruit capsular :—
Ovary and fruit 5-celled ; ovules on axial placentas
74. **Bergia.**
Ovary and fruit 1-celled ; ovules on a free-central or basal placenta :—
Sepals and petals each 5 ; capsule 3–5-valved ; stipules scarious ....67. **Spergula.**
Sepals 2 only, petals 4–5 ; capsule circumscissile ; stipules reduced to nodal appendages..................71. **Portulaca.**
Leaves without stipules :—
‡Ovary superior ; styles free, sometimes (*Hiptage*) style solitary :—[p. 89]
Herbs ; ovary 1-celled ; ovules on a basal placenta ; fruit a capsule :—
Calyx gamosepalous ....65. **Saponaria.**
Calyx of free sepals ....66. **Stellaria.**
Shrubs, climbing or suberect ; ovary 3-celled ; ovules solitary in each cell ; fruit of one or more winged samaras :—

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Styles 3 ; flowers small, regular or nearly so
124. **Aspidopterys.**
Styles 2 or 1 ; flowers large, irregular ....123. **Hiptage.**
‡Ovary inferior :—[p. 88]
Ovary 1-celled ; ovules few, suspended by long funicles :—
Calyx-tube above the ovary less than half an inch long
327. **Combretum.**
Calyx-tube above the ovary more than half an inch long
328. **Quisqualis.**
Ovary 4–5-celled, joined to the calyx by vertical walls ; ovules very many on axial placentas :—
Stamens all alike ....338. **Osbeckia.**
Stamens very unequal ....339. **Melastoma.**
⊙Perianth 1-seriate, a calyx only :—[p. 88]
Shrubs ; style simple ; ovary 1-celled :—
Perianth-tube with ten scales above the stamens ; limb not accrescent ....805. **Linostoma.**
Perianth-tube with no scales above the stamens ; limb much accrescent and persistent ....324. **Calycopteris.**
Herbs ; styles 2 or more, free :—
Calyx-tube elongated ; stamens inserted on the calyx
382. **Trianthema.**
Calyx deeply 5-partite ; stamens hypogynous ......383. **Mollugo.**

Class XI. DODECANDRIA.

Leaves compound :—
Leaves digitately 3–5-foliolate, not gland-dotted ; herbs with narrow 2-valved, capsular fruit ....50. **Cleome.**
Leaves unequally pinnate, glandular-punctate ; armed trees with large, globose, indehiscent fruit..145. **Feronia.**
Leaves simple :—
Leaves all radical, parallel-veined ; aquatic herbs, styles free :—
Ovary inferior ; carpels united, only the styles free......890. **Ottelia.**
Ovary superior ; carpels apocarpous :—
Fruit of indehiscent achenes ....1017. **Sagittaria.**
Fruit of dehiscent follicles..........................1018. **Butomopsis.**
Leaves not radical ; reticulate-veined :—
*Leaves alternate ; sepals or calyx-lobes more than 2 :—[p. 91]

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Styles free; stamens in fascicles opposite the petals; ovary half-superior, 1-celled, placentas parietal, ovules several; trees 355. **Homalium.**

Style simple, or styles connate :—

Ovary superior :—

Petals connate in a gamophyllous corolla; stamens opposite the corolla-lobes :—

Segments of calyx 4 ....525. **Bassia.**

Segments of calyx 6–8 ....524. **Dichopsis.**

Petals free; stamens not opposite petals :—

Leaves not gland-dotted :—

Ovary 1-celled, placentas parietal; flowers polygamous; trees with large, globose, indehiscent fruit 59. **Taraktogenos.**

Ovary 2–more-celled :—

Ovules in each cell 2; petals contorted; sepals valvate or subvalvate; leaves entire or slightly lobed :—

Calyx enlarging in fruit, the sepals at first slightly imbricate; fruit nut-like :—

Sepals faintly united at the base only; segments subvalvate in fruit :—

Two calyx-lobes expanded into narrow wings 87. **Vatica.**

All calyx-lobes equal in fruit........ 88. **Isauxis.**

Sepals quite free; quite valvate in fruit; the 3 outer lobes expanded in fruit ......89. **Shorea.**

Calyx not enlarging, deciduous in fruit; sepals always valvate; fruit an indehiscent or 3–5-coccous spiny or bristly capsule ....118. **Triumfetta.**

Ovules in each cell many; petals imbricate; sepals open in bud; leaves pinnatifid ....126. **Peganum.**

Leaves gland-dotted ....144. **Atalantia.**

Ovary inferior; or carpel solitary in base of calyx-tube :—

Ovary 1-celled or carpel solitary :—

Leaves penninerved; stipules small; flowers minute, petals very minute, sometimes 0; carpel solitary, basal in calyx-tube with 2 pendulous ovules; fruit a thin-walled dry or fleshy drupe ....306. **Pygeum.**

Leaves 3-nerved from base; stipules 0; flowers conspicuous; petals valvate; ovary 1-celled with 1 pendulous ovule; fruit a 1-seeded berry ....400. **Alangium.**

Ovary 4–more-celled :—

Small trees with huge palmately-lobed leaves; flowers in umbels ....399. **Trevesia.**

Aquatic herbs with small entire leaves; flowers not umbellate ....351. **Jussiæa.**

*Leaves opposite, or if alternate (*Talinum* sometimes) the sepals 2 only:—[p. 89]

Perianth of only one series (calyx); stamens inserted on calyx-tube:—

Ovary and capsule 3–5-celled ....381. **Sesuvium.**

Ovary and capsule 1–2-celled ....382. **Trianthema.**

Perianth of two series (calyx and corolla); ovary 2-more-celled:—

Sepals or lobes of calyx 4 or more:—

Petals united in a gamophyllous corolla; stamens inserted on the corolla ....732. **Symphorema.**

Petals free; stamens inserted on the calyx:—

Leaves without stipules; ovary at the bottom of the calyx-tube, free..344. **Woodfordia.**

Leaves stipulate; ovary adnate to calyx-tube:—

Species of mangrove swamps; embryo without albumen, macropodous and germinating while fruit is still on the tree:—

Petals 5–6, emarginate ....320. **Ceriops.**

Petals 8–14, 2-fid ....322. **Bruguiera.**

Species of inland forests; embryo small, immersed in albumen, not germinating on the tree ...323. **Carallia.**

Sepals 2 only; petals free; ovary 1-celled; placentas basal:—

Ovary half-adnate; leaves with scaly or hairy nodal appendages, thick, succulent ....71. **Portulaca.**

Ovary free; leaves without stipules, flat, *sometimes only subopposite or alternate* ....72. **Talinum.**

Class XII. ICOSANDRIA.

*Leaves compound:—[p. 92]

Leaves even-pinnate; carpel solitary:—

Leaves twice pinnate; leaflets many, small ....301. **Acacia.**

Leaves simply pinnate; leaflets few, large ....280. **Cynometra.**

Leaves odd-pinnate or digitate; carpels many:—

†Leaves digitately 3-foliolate; fruit of many achenes, not include in the calyx-tube [p. 92] ....307. **Fragaria.**

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†Leaves odd-pinnate :—[p. 91]

Fruit of many achenes not included in the calyx-tube ; unarmed herbs ....308. **Potentilla.**

Fruit of many or few achenes, included in the calyx-tube ; shrubs armed with prickles ....310. **Rosa.**

*Leaves simple, or, rarely, leaves absent :—[p. 91]

Leaves 0 ; plants with thick fleshy flattened prickly stems 380. **Opuntia.**

Leaves conspicuous :—

Leaves alternate :—

Sarmentose shrubs, armed with flattened prickles......309. **Rubus.**

Erect, unarmed trees or shrubs :—

Leaves 3-nerved at base ; petals valvate ; ovary 1-celled and 1-ovuled ....400. **Alangium.**

Leaves penninerved ; petals imbricate, rarely (*Pygeum*) petals absent :—

Stamens in fascicles opposite the petals ; ovary of 2–5 carpels connate in a 1-celled chamber with parietal ovules 355. **Homalium.**

Stamens not fascicled opposite the petals :—

Ripe carpel solitary ; not enclosed in the calyx-tube 306. **Pygeum.**

Ripe carpels 2 or more, confluent and enclosed in the calyx-tube :—

Ovary 5-celled ; flowers panicled.........311. **Eriobotyra.**

Ovary 2–3-celled ; flowers corymbose 312. **Pourthiæa.**

Leaves opposite :—

Herbs with fleshy leaves ; some of the leaves may be alternate :—

Sepals 2 only ; ovary 1-celled with basal placenta ; petals distinct ....71. **Portulaca.**

Sepals 5 connate in a tube ; ovary 5-celled with axial placentas ; petals 0 ....381. **Sesuvium.**

Shrubs or trees ; leaves never fleshy, all opposite :—

Leaves stipulate ; ovules pendulous :—

Petals 5–6, lacerate ; ovary 1-celled ....321. **Kandelia.**

Petals 8–14, 2-fid ; ovary 2–4-celled............322. **Bruguiera.**

Leaves without stipules ; ovules axial ; rarely pendulous :—

‡Leaves gland-dotted ; fruit a berry :—[p. 93]

§Limb of calyx closed in bud, lobes subimbricated, rather deeply valvately separated when in flower ; seeds many [p. 93] ....332. **Psidium.**

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§Limb of calyx 4–5-lobed or partite in bud, not further divided when in flower ; seeds few :—[p. 92]
Ovules pendulous from top of locules ......333. **Pimenta.**
Ovules from the whole inner angle or from a somewhat prominent septal placenta :—
Embryo with small seed-leaves ....334. **Myrtus.**
Embryo with large fleshy seed-leaves ...335. **Eugenia.**
‡Leaves not gland-dotted ; calyx-lobes valvate :—[p. 92]
Fruit a berry ; seeds in pulp :—
Calyx-tube adnate to ovary ....350. **Punica.**
Calyx-tube almost free from ovary ......349. **Sonneratia.**
Fruit a capsule ; seeds not pulpy :—
Stamens in several rows ; seeds large with a distinct wing 347. **Lagerstrœmia.**
Stamens in one row ; seeds small, faintly winged 348. **Duabanga.**

Class XIII. POLYANDRIA.

Leaves opposite :—
Sepals valvate ; climbers with free carpels and styles ; leaves compound :—
Petals 0..1. **Clematis.**
Petals many, linear ....2. **Naravelia.**
Sepals in decussate pairs or imbricate, rarely closed in bud and then carpels connate ; trees or shrubs with styles and carpels connate or with a simple style ; leaves simple :—
Cells of the ovary 1-ovuled :—
Ovary 2–more-celled :—
Calyx of 4 or 5 sepals ....80. **Garcinia.**
Calyx closed in bud, bursting into 2 valves ...77. **Ochrocarpus.**
Ovary 1-celled...79. **Calophyllum.**
Cells of the ovary 2, each 2-ovuled ....78. **Mesua.**
Leaves alternate :—
*Leaves compound :—[p. 94]
Petals 0 ; carpels free ; petiole sheathing ....3. **Thalictrum.**
Petals distinct ; carpels united, style simple ; petiole not sheathing :—
¶Sepals 4, free ; leaves not gland-dotted :—[p. 94]
Herbs ; leaves digitately 5–9 foliolate ; fruit a 2-valved capsule 50. **Cleome.**
Small trees ; leaves 3-foliolate ; fruit a berry ......53. **Cratæva.**

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¶Sepals connate in a 4–5-toothed calyx; leaves gland-dotted, 3-foliolate; fruit a large berry with woody rind [p. 93] 146. **Ægle.**

*Leaves simple; or if compound (*Citrus*) then 1-foliolate:—[p. 93]

†Styles more than 1, free:—[p. 95]

Sepals and petals arranged in whorls of 3; trees or shrubs:—

Stipules large, enclosing the leaf-buds; petals in several series:—

Carpels in a loose spike on a stalked gynophore...8. **Michelia.**

Carpels densely packed on a sessile gynophore...9. **Magnolia.**

Stipules 0; petals in 2 series:—

Carpels not confluent in fruit:—

Petals imbricate ....11. **Uvaria.**

Petals valvate:—

Anther-cells not concealed by overlapping connective:—

Petals of inner series larger than those of outer:—

Ovules 6 or more......................12. **Saccopetalum.**

Ovules 1 or 2 ....13. **Miliusa.**

Petals subequal; ovules 4–8 ....14. **Alphonsea.**

Anther-cells concealed by overlapping connective:—

Peduncles hooked; petals connivent at concave base 15. **Artabotrys.**

Peduncles not hooked:—

Petals of both series flat, lanceolate, subequal, spreading from base:—

Ovules many, 2-seriate...................16. **Cananga.**

Ovules definite:—

Ovules 2–6, 1-seriate on the ventral suture 17. **Unona.**

Ovules 1–2, basal or subbasal ...18. **Polyalthia.**

Petals of the 2 series unequal:—

Petals of outer series spreading; those of inner concave connivent, overarching the stamens and carpels ....19. **Mitrephora.**

Petals of outer series thick, rigid, connivent, larger than those of the inner ....20. **Melodorum.**

Carpels confluent; petals valvate, those of outer series thick, rigid, connivent, larger than those of inner; anther-cells concealed by overlapping connective ....21. **Anona.**

Sepals and petals never 3-merous, either arranged in whorls of 5 each or passing insensibly from sepals to petals in a continuous spiral:—

‡Trees; carpels cohering in the axis, each many-ovuled; styles free; sepals and petals each 5 [p. 95] ....7. **Dillenia.**

‡Herbs ; carpels not or only partially cohering :—[p. 94]

Carpels connate below, free above ; ovules in each more than 2 ; sepals and petals each 5 ; leaves dissected ......5. **Nigella.**

Carpels not connate ; ovules in each not more than 2 :—

Carpels several, close set on the thalamus ; ovule solitary in each ; petals 5, sepals 3–5 ; leaves penninerved 4. **Ranunculus.**

Carpels many, discrete, irregularly scattered and sunk in pits of the turbinate disk ; ovules 1–2 in each ; petals and sepals many in a continuous spiral ; leaves peltate 35. **Nelumbium.**

†Style simple on a solitary carpel or styles connate with a syncarpous ovary :—[p. 94]

Stamens adnate to the petals or corolla-tube :—

Ovules in each loculus of ovary solitary ; petals connate 525. **Bassia.**

Ovules in each loculus of ovary 2 ; petals free or faintly connate 529. **Symplocos.**

Stamens not adnate to the petals or only slightly adnate at the point of insertion of both :—

Floating aquatic herbs ; sepals 4 ; petals numerous :—

Sepals, petals and stamens half-superior, inserted on a disk which is confluent with the carpels ; plants unarmed 33. **Nymphæa.**

Sepals tubular below and confluent with the disk in which the carpels are enclosed ; petals and stamens superior ; plants prickly ....34. **Euryale.**

Erect or climbing terrestrial herbs, shrubs or trees :—

Sepals more or less connate below in a calyx-tube :—

Petals contorted ; leaves simple, not gland-dotted :—

Anthers globose, cells at length confluent at top ; staminodes 5 within the stamens ....116. **Brownlowia.**

Anthers elongated, cells distinct ; staminodes 0 :—

Fruit free from calyx-tube ; 2 calyx-lobes much accrescent.................................86. **Dipterocarpus.**

Fruit slightly adnate to calyx-tube, which is very short ; three outer calyx-lobes much accrescent 89. **Shorea.**

Petals imbricate ; leaves pellucidly gland-dotted, 1-foliolate with winged petiole jointed to the blade ...147. **Citrus.**

Sepals free :—

§Sepals imbricate :—[p. 96]

- Sepals 2–3 :—
  - Sepals 2, petals 4 ; stigma radiating, sessile 36. **Papaver.**
  - Sepals 3, petals 6 ; stigma lobed, style short, distinct 37. **Argemone.**
- Sepals 4–5 :—
  - Sepals 4, in 2 decussate pairs, the inner imbricate, the outer at times subvalvate ; ovules on parietal placentas:—
    - Ovary stalked..................................52. **Capparis.**
    - Ovary sessile...........................59. **Taraktogenos.**
  - Sepals 5, regularly imbricating :—
    - Sepals deciduous ; ovary 1-celled ; placentas parietal or intruded :—
      - Flowers large yellow, appearing before the leaves 55. **Cochlospermum.**
      - Flowers medium white or pink, appearing with the leaves ....56. **Bixa.**
    - Sepals persistent :—
      - Ovary of 1 carpel ; a woody climber ; fruit a follicle ....6. **Delima.**
      - Ovary of 3–10 carpels, connate ; trees or shrubs :—
        - Fruit a capsule :—
          - Peduncles many-flowered ......84. **Saurauja.**
          - Peduncles 1-flowered ....82. **Schima.**
        - Fruit of 3–10 drupes seated on a broad disk 150. **Ochna.**

§Sepals valvate :—[p. 95]

- Petals thin, coloured, unguiculate, entire or subentire ; imbricate or twisted in bud ; anthers oblong :—
  - Petals with a more or less adnate basal scale, inserted round base of a raised torus ; stamens arising from apex of torus :—
    - Fruit drupaceous ; not prickly............117. **Grewia.**
    - Fruit small, globose, indehiscent or separating into cocci ; prickly ....118. **Triumfetta.**
  - Petals without a basal scale, inserted directly round stamens on a contracted torus ; fruit a loculicidal capsule ....119. **Corchorus.**
- Petals rigid, white or sepaloid, almost always laciniate, induplicate-valvate in bud ; anthers linear ; stamens arising in groups opposite the petals and alternate with lobes of a 5-lobed torus ; fruit drupaceous ....120. **Elæocarpus.**

Class XIV. DIDYNAMIA.

Limb of corolla both plicate and slightly 2-labiately imbricate 641. **Browallia.**

Lobes of corolla more or less markedly 2-labiately imbricate or contorted, never plicate:—

*Carpels or placentas more than 2-ovuled or if only 2-ovuled (nearly all *Acanthaceæ*) the ovules not collateral:—[p. 102]

Leaves compound; trees:—

Capsule septifragal, linear, compressed parallel to the septum; leaves 2–3-pinnate; calyx small, cup-shaped; corolla long, slender, narrow tubular ....679. **Millingtonia.**

Capsule loculicidal; leaves 1–2 pinnate; calyx large; corolla-tube short or long, much widened at the mouth:—

Capsule not winged, cylindric or subquadrangular or compressed with sides parallel to septum:—

Calyx tubular-campanulate equally 5-toothed, capsule compressed..680. **Tecoma.**

Calyx ovoid or oblong, never equally 5-toothed; capsule round, quadrangular or only slightly compressed:—

Calyx spathaceous, cleft to the base on one side in flower, closed in bud; corolla-tube long or short, cylindric below, campanulate above, lobes crisped crenate or incised; capsule elongate, terete or somewhat compressed, nearly straight ....681. **Dolichandrone.**

Calyx not spathaceous; corolla-tube ventricose:—

Calyx irregularly deeply 3–5-lobed in flower, closed in bud; capsule falcate or twisted ...682. **Heterophragma.**

Calyx truncate or shortly unequally lobed in flower, closed or open in bud; capsule with a thickened spongy septum ....683. **Stereospermum.**

Capsule with double wings along the margin, oblong, compressed at right angles to the septum; calyx large or swollen, campanulate, limb 5-fid ....684. **Pajanelia**

Leaves simple, rarely 0; herbs:—

†Ovary 1-celled; placentas parietal or intruded:—[p. 98]

**Leafless parasitic herbs; placentas not intruded; fruit a 2-valved capsule:—[p. 98]

††Calyx spathaceous, split in front; corolla-lobes all broad spreading [p. 98] ....669. **Æginetia.**

††Calyx unequally 4-toothed or split both behind and in front; corolla with upper lip more erect than the lower 3-fid lip [p. 97]..670. **Orobanche.**

**Leafy herbs; placentas intruded; leaves alternate or opposite:—[p. 97]

Fruit a 2-valved or ultimately 4-valved tetragonous capsule 686. **Sesamum.**

Fruit an indehiscent or irregularly breaking up berry:—

Calyx plicate; fruit bursting irregularly; disk 0 676. **Stauranthera.**

Calyx not plicate; fruit indehiscent; disk annular 677. **Rhynchotechum.**

†Ovary perfectly 2-celled:—[p. 97]

‡Ovules on each placenta more than 2, usually many, not superposed in one row; seeds albuminous, not supported on retinacula, capsule never elastically dehiscent:—[p. 100]

Leaves all alternate; corolla subrotate, tube short, throat narrow, lobes 5, broad, subequal, the two upper outmost in bud ....642. **Celsia.**

Leaves at least the lower if not all opposite; corolla-tube elongated, or if short (*Sopubia*) the two upper lobes inmost in bud:—

Corolla-tube bulging or spurred at the base in front; limb personate the palate on the lower lip closing the throat, upper lip also 2-gibbous outmost in bud; capsule opening by pores; anther-cells discrete; leaves alternate above:—

Corolla spurred in front ....643. **Linaria.**

Corolla saccate but not spurred in front 644. **Antirrhinum.**

Corolla-tube not enlarged at the base in front; limb not personate; capsule opening by valves:—

§Corolla with upper lip or 2 upper lobes outermost and lower lobe inmost in bud; tube cylindric with more or less expanded throat:—[p. 100]

¶Stamens all inserted within the tube:—[p. 100]

*Corolla not distinctly 2-lipped, lobes all rounded subequal; anther-cells divaricate, confluent 1-locular; calyx 5-partite; capsule septicidal; valves shortly 2-fid:—[p. 99]

⊙Calyx-lobes much imbricated; filaments incurved; leaves opposite or whorled; capsule globose [p. 99] ....645. **Russelia.**

⊙Calyx-lobes hardly imbricated; filaments filiform; leaves opposite below, alternate above; capsule ovate-oblong [p. 98]............646. **Sutera.**

*Corolla distinctly 2-lipped or if lobes subequal (*Herpestis*) the anther-cells not confluent; capsule loculicidal or both loculicidal and septicidal; if anther-cells confluent (*Mimulus*) the lower lip with 2-gibbous throat:—[p. 98]

Corolla with 2-gibbous throat; anther-cells divaricate; capsule loculicidal:—

Calyx 5-angled and 5-toothed; anther-cells often confluent 1-celled; leaves all opposite 647. **Mimulus.**

Calyx wide campanulate, 2-fid; anther-cells contiguous but distinct; lower leaves opposite, upper alternate..........................648. **Mazus.**

Corolla-throat not 2-gibbous; anther-cells distinct:—

Calyx wide campanulate, 2-fid; corolla-throat with 2 parallel ridges; anther-cells disjoined, stipitate; capsule loculicidal 649. **Lindenbergia.**

Calyx 5-partite; corolla-throat without ridges; capsule both loculicidal and septicidal:—

Anther-cells disjoined, stipitate:—

Uppermost lobe of calyx considerably or greatly exceeding the others; 2 or all of the stamens with 1 cell imperfect 650. **Adenosma.**

Uppermost lobe of calyx not much if at all larger than the others; all the stamens perfect:—

Placentæ either separating in the fruit, or, if conjoined in a column, the column not winged; seeds terete 651. **Stemodia.**

Placentæ always conjoined in a column, winged by the remains of the septa; seeds angular............652. **Limnophila.**

Anther-cells contiguous though distinct; calyx 5-partite, lateral segments inmost, much narrower than the others; corolla with 5 subequal lobes ....653. **Herpestis.**

¶Stamens with only posterior pair inserted within corolla-tube, the anterior pair inserted on corolla-throat; capsule septicidal; leaves all opposite:—[p. 98]

Calyx with 3–5 ridges or wings; mouth oblique, 3–5-toothed or 2-lipped ....655. **Torenia.**

Calyx without wings, 5-lobed or 5-partite, the segments equal ....656. **Vandellia.**

§Corolla with upper lip or 2 upper lobes inmost in bud; leaves opposite below, often alternate above; wholly or partially parasitic plants; capsule loculicidal:—[p. 98]

Leaves entire or dentate or reduced to scales:—

Corolla subglobose-campanulate, limb oblique; calyx campanulate; anther-cells both perfect...664. **Alectra.**

Corolla narrow-tubular; only one anther-cell perfect:—

Calyx tubular, 5-toothed or 5-fid; corolla-tube narrow throughout; anthers 1-locular, vertical:—

Corolla-tube straight or slightly incurved, lobes subequal; basal leaves much larger than those above ....665. **Buchnera.**

Corolla-tube abruptly incurved at or above the middle, two upper lobes smaller than the others; basal leaves not much larger than those above 666. **Striga.**

Calyx spathaceous, compressed, split in front; corolla slightly ventricose at the throat, limb obscurely 2-lipped; anthers with one perfect and one sessile empty cell ....667. **Centranthera.**

Leaves pinnately dissected with linear segments; calyx campanulate; corolla-tube short, throat much widened, lobes subequal; anthers with one empty stipitate cell 668. **Sopubia.**

‡Ovules in each cell 2, rarely more, superposed in one, rarely two rows, or arranged alternately; seeds without albumen, supported usually on hard retinacula; capsule loculicidally 2-valved, the valves separating elastically from the apex; leaves opposite:—[p. 98]

*Seeds not supported on hard retinacula; ovules in each cell many:—[p. 101]

⊙Ovules superposed in 2 rows in each cell; corolla-lobes imbricate, upper lobes outermost in bud; leaves never pinnately cut [p. 101] ....690. **Ebermaiera.**

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⊙Ovules not in 2 rows; corolla-lobes twisted to the left in bud; lower leaves pinnately cut [p. 100] 691. **Cardanthera.**

- *Seeds supported on hard upward-curving retinacula; ovules 2 not collateral, or if more than 2 (rarely exceeding 8) superposed in one row or else arranged alternately in each cell:—[p. 100]
  - Corolla with no upper lip, the lower lip large, expanded, 3-lobed; ovules 2 in each cell:—
    - Anterior filaments with an excurrent process 692. **Blepharis.**
    - Anterior filaments without any process...693. **Acanthus.**
  - Corolla with either 2 lips or with 5 subequal lobes:—
    - Corolla-lobes twisted to the left in bud:—
      - Ovules more than 2 in each cell; capsules normally with 6 or more seeds:—
        - Corolla distinctly 2-lipped ....694. **Hygrophila.**
        - Corolla subequally 5-lobed:—
          - Bracteoles large; capsule clavate with a solid base 695. **Ruellia.**
          - Bracteoles small, narrow, or 0; capsule seed-bearing throughout:—
            - Anthers acuminate at tips...696. **Æchmanthera.**
            - Anthers blunt-tipped ....697. **Hemigraphis.**
      - Ovules 2 in each cell; capsules normally with 4 or fewer seeds; corolla usually subequally 5-lobed:—
        - Placentas separating elastically from the valves from the base upwards:—
          - Bracteoles very large, reticulately nerved 698. **Petalidium.**
          - Bracteoles 0..........................699. **Phaylopsis.**
        - Placentas not separating elastically from the valves:—
          - Anthers minutely mucronate at the base 700. **Calophanes.**
          - Anthers muticous ....702. **Strobilanthes.**
    - Corolla-lobes imbricated in bud; ovules 2, rarely 1 in each cell:—
      - Corolla-lobes 5, subequal:—
        - Anthers 1-celled; outer calyx-lobes larger than the others ....706. **Crossandra.**
        - Anthers 2-celled; sepals subequal...708. **Asystasia.**
      - Corolla distinctly 2-lipped; anthers 2-celled 711. **Lepidagathis.**

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*Carpels 1-ovuled, or if 2-ovuled the ovules collateral; leaves always opposite:—[p. 97]

Fruit a loculicidally 2-valved capsule, the valves separating elastically from apex downwards; climbing shrubs. 687. **Thunbergia.**

Fruit indehiscent with 1–4 pyrenes, or separating into 2–4, rarely more, 1-seeded cocci or nutlets:—

†Ovary entire; fruit containing 1–4, rarely more, pyrenes, or subcapsular, each valve with 1 pyrene attached; leaves rarely glandular:—[p. 103]

Leaves digitately compound; trees or shrubs; inflorescence cymose; fruit indehiscent ....728. **Vitex.**

Leaves simple:—

Inflorescence with the lowest flowers opening first:—

Inflorescence of dense spikes:—

Fruit with 2 or 1 one-seeded pyrenes; spikes capitate, ovoid or cylindric; calyx small; shrubs or undershrubs, rarely herbs:—

Fruit succulent or leathery, not dehiscent 719. **Lantana.**

Fruit dry, partially dehiscing; one species herbaceous 720. **Lippia.**

Fruit with 4 one-seeded pyrenes; spikes elongated; calyx tubular; herbs ....722. **Verbena.**

Inflorescence racemose; fruit fleshy with 2 two-seeded pyrenes; shrubs ....723. **Duranta.**

Inflorescence centrifugal, cymose:—

‡Cymes lax or dense, paniculate or thyrsoid; trees or shrubs:—[p. 103]

Fruit indehiscent:—

Drupe containing one 4-celled pyrene; erect trees or shrubs:—

Flowers large, an inch long ....726. **Gmelina.**

Flowers very small ....727. **Premna.**

Drupe containing four 1-seeded pyrenes:—

Calyx campanulate or tubular or suburceolate, truncate, 5-toothed or deeply 5-fid; erect shrubs 729. **Clerodendron.**

Calyx rotate, widely patent, entire or obscurely 5-lobed; climbing shrubs.........730. **Holmskioldia.**

Fruit breaking up into 4 valves with 1 pyrene attached to each; trees or shrubs ....731. **Caryopteris.**

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‡Cymes densely capitate, 3-9-flowered, the heads subtended by 3-4 involucrate bracts; fruit small, nearly dry; large climbers [p. 102]..................................734. **Congea.**

†Ovary distinctly 4-lobed or -partite; fruit of 4, rarely fewer, 1-seeded indehiscent nutlets; leaves almost always gland-dotted:—[p. 102]

§Ovary 4-partite; nutlets with the attachment small, basilar or slightly oblique to the outer side:—[p. 105]

¶ Nutlets dry:—[p. 105]

*Stamens declinate; anther-cells ultimately explanate confluent:—[p 104]

⊙Attachment of nutlets quite basilar; upper lobe of calyx usually broader than the rest and at least broader than the 2 anterior lobes, or, if the calyx-lobes are subequal (*Plectranthus* often, *Hyptis* always), the stamens exserted and the lowest corolla-lobe concave:—[p. 104]

**Lower lip of corolla somewhat declinate, flat or very slightly concave, generally narrower but hardly longer than the 4-lobed upper lip; upper lobe of calyx always widest:—[p. 104]

Calyx deflexed in fruit with the upper lobe large ovate recurved, its margins decurrent on the tube, the other lobes narrow, subulate:—

Corolla-tube short; stigma 2-fid ...736. **Ocimum.**

Corolla-tube usually long; stigma entire 737. **Orthosiphon.**

Calyx suberect or declinate in fruit, the upper lobe broader than the lateral and anterior pairs or (*Moschosma* sometimes) only broader than the anterior and equalling the lateral pair, not decurrent on the tube:—

Whorls in terminal and axillary globose or ovoid heads with imbricate bracts; calyx suberect, upper lip widely 1-lobed, anterior and lateral lobes united in an entire or 4-toothed lower lip ....738. **Acrocephalus.**

Whorls racemose or subspicate; calyx usually declinate, upper lip widely 1-lobed with the anterior and lateral pairs not connate, subequal, smaller; or with upper lip 3-lobed, the posterior and lateral lobes being subconnate, and with a 2-lobed lower lip formed by the 2 subconnate anterior lobes:—

Racemes simple, bracts conspicuous; calyx in fruit rugosely pitted near base; posterior lobe even when the upper lip is 3-lobed wider than the lateral lobes ....739. **Geniosporum.**

Racemes panicled, bracts small; calyx in fruit not pitted, lateral lobes when the upper lip is 1-lobed subequal with anterior lobes, when upper lip is 3-lobed subequal with posterior lobe ....740. **Moschosma.**

**Lower lip of corolla deflexed, concave boat-shaped or saccate:—[p. 103]

Corolla with upper lip very short, obtusely 3–4-toothed, lower lip much elongated, boat-shaped:—

Calyx equally 5-toothed or somewhat 2-lipped with 3-toothed upper and 2-toothed lower lip or with the upper lip large rounded reflexed, the others narrow subulate:—

Filaments free ....741. **Plectranthus.**

Filaments at their bases connate in a sheath round the style..........................742. **Coleus.**

Calyx very oblique 2-lipped with the upper lobe large entire inflexed and closing calyx-mouth, the lower lip truncate obscurely 4-toothed; or 1-lipped slit in front, the solitary lip 5-toothed incurved but not quite occluding the calyx-mouth ....743. **Anisochilus.**

Corolla obscurely 2-lipped with 2 upper lobes flat, similar and subequal to 2 lateral, all about as long as the abruptly deflexed saccate lower lip with thickened margins and much contracted base; calyx-teeth subequal ....744. **Hyptis.**

⊙Attachment of nutlets slightly oblique to the outer side; calyx-lobes subequal, tube 13–15-nerved; corolla 2-lipped, upper lip 2-fid, lower 3-fid, lobes all flat spreading; stamens included in the tube [p. 103]
745. **Lavandula.**

*Stamens erect, or ascending or spreading:—[p. 103]

‡Corolla-lobes 4 or 5, flat subequal and similar or the lowest somewhat unlike the others but limb not perfectly 2-lipped; stamens diverging; anther-cells short:—[p. 105]

÷Lobes of corolla 4; anthers 1-celled; calyx 5-nerved, equally 5-toothed:—[p. 105]

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Lower corolla-lobe subpatent; whorls in glomerate or paniculate or solitary interrupted spikes; filaments bearded or naked ....746. **Pogostemon.**

Lower corolla-lobe like the others; whorls in slender dense continuous spikes; filaments bearded 747. **Dysophylla.**

÷Lobes of corolla 5, lowest rather longer than the others; anthers, at least when young, 2-celled; calyx 10-nerved, in fruit declinate, distinctly 2-lipped [p. 104] 749. **Perilla.**

‡Corolla distinctly 2-lipped:—[p. 104]

Anterior pair of stamens the longer:—

Calyx 13-nerved; anthers 2-celled, cells short; upper lip of corolla not hooded:—

Calyx equally 5-toothed .... 750. **Micromeria.**

Calyx distinctly 2-lipped......... 751. **Calamintha.**

Calyx 5–10-nerved; anthers 2-celled, cells linear:—

Upper lip of corolla short, nearly flat, not woolly; stamens exserted, anther-cells of upper pair dimidiate, of lower pair paralled transverse 752. **Anisomeles.**

Upper lip of corolla long concave, densely woolly:—

Anther-cells parallel; stamens more or less exserted; calyx 5-toothed, teeth spinescent 753. **Leonurus.**

Anther-cells divergent; stamens not exserted; calyx 6–10-toothed:—

Lower lip of corolla longer than the hood 754. **Leucas.**

Lower lip of corolla shorter than the hood 755. **Leonotis.**

Posterior pair of stamens the longer; calyx 15-nerved, 5-toothed; stamens not exserted 756. **Nepeta.**

¶Nutlets succulent; corolla 2-lipped, upper lip hooded; anther-cells parallel, anterior pair of stamens the longer [p. 103] ....759. **Gomphostemma.**

§Ovary 4-lobed; nutlets with a large oblique or lateral areola on the inner side; stamens erect exserted from the notch or fissure of the upper lip:—[p. 103]

Corolla deeply slit behind and apparently 1-lipped, the two

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small upper lobes along with the small lateral pair springing from the contracted base of the very large lower lobe 760. **Teucrium.**

Corolla distinctly 2-lipped, upper lip short 2-lobed, notched; lateral pair of lobes very small, springing from sides of very large lower lobe.......................................761. **Ajuga.**

Class XV. TETRADYNAMIA.

*Fruit dehiscent:—[p. 107]

Pods narrow, long:—

Pods bearing seeds and dehiscing throughout their length; sepals not pouched at the base; cotyledons accumbent:—

Pods almost cylindric; seeds globose, 2-seriate or irregularly 1-seriate; flowers yellow..............................39. **Nasturtium.**

Pods flattened; seeds compressed, 1-seriate; flowers white 40. **Cardamine.**

Pods with a seedless indehiscent beak projecting beyond the valves: sepals pouched at the base; cotyledons longitudinally folded or incumbent:—

Pods narrow, cylindric or turgid; beak cylindric or conical; seeds 1-seriate; flowers yellow or yellow with green veins 41. **Brassica.**

Pods turgid, beak flattened; seeds 2-seriate; flowers lilac or yellow with lilac veins...42. **Eruca.**

Pods broad, short; sepals not pouched at base:—

Pods globose; seeds many, small, compressed; cotyledons accumbent; flowers (in our species) yellow....................43. **Cochlearia.**

Pods flattened:—

Pods compressed from the back, paralled to the expanded replum; seeds few, compressed; cotyledons accumbent, flowers (in our species) white...44. **Alyssum.**

Pods compressed laterally at right angles to the very narrow replum:—

Valves of the many-seeded pods not winged; cotyledons incumbent; flowers white ....45. **Capsella.**

Valves of the few-seeded pods winged, the tip of the pod notched:—

Seeds in each cell 4–6; cotyledons accumbent ... 47. **Thlaspi.**

Seeds in each cell solitary; cotyledons incumbent 46. **Lepidium.**

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*Fruit indehiscent:—[p. 106]

Pods short, globose, 2-celled, each cell 1-seeded; sepals spreading not pouched at base; white flowers and pods both very small 48. **Senebiera.**

Pods elongated, terete, hollow or transversely septate; sepals erect, pouched at the base; flowers yellow, white, or lilac with purple veins and pods both large ....49. **Raphanus.**

Class XVI. MONADELPHIA.

*Stamens definite, fewer than 20:—[p. 117]
  †Leaves compound:—[p. 110]
    ‡Carpel solitary; fruit a dehiscent or indehiscent pod:—[p. 109]
      Flowers regular; petals valvate; leaves evenly twice pinnate; stamens 10 ....291. **Parkia.**
      Flowers irregular; petals imbricate; leaves only once ternate or digitate or pinnate:—
        §Plants with basifixed hairs or glabrous; anthers neither mucronate nor gland-tipped:—[p. 108]
          ¶Pod dehiscent by both sutures, from apex to base:—[p. 108]
            Leaf-rachis ending in a bristle; stamens 9 in a sheath slit above; leaves even-pinnate ....221. **Abrus.**
            Leaf-rachis not ending in a bristle; leaves with a terminal leaflet:—
              Leaves digitately 3–7-foliolate ....223. **Crotalaria.**
              Leaves pinnately compound:—
                **Leaves 3-foliolate:—[p. 108]
                  Nodes of the rachis not swollen:—
                    Style bearded below the stigma; pod *square, 4-winged* ....236. **Psophocarpus.**
                    Style not bearded below the stigma:—
                      Stamens 10 fertile, at first monadelphous but ultimately 2-adelphous by solution of vexillary stamen..................................238. **Glycine.**
                      Stamens 5 fertile with 5 intercalary sterile, persistently monadelphous......239. **Teramnus.**
                  Nodes of the rachis swollen:—
                    Upper lip of calyx projecting ......240. **Canavalia.**
                    Upper lip of calyx not projecting:—

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Unarmed climbers :—

Pod oblong, turgid ; anthers dimorphous, only 6 fertile ....241. **Dioclea.**

Pod linear, flat or subcylindric, many-seeded ; anthers uniform ......242. **Pueraria.**

Armed trees ....245. **Erythrina.**

**Leaves 5- or more-foliolate :—[p. 107]

Style bearded below the stigma ; flowers with very unequal petals ; standard large ....249. **Clitoria.**

Style not bearded ; flowers medium ; standard not longer than other petals :—

Leaflets closely parallel-veined, pod thin, early dehiscent ....251. **Tephrosia.**

Leaflets reticulately veined ; pod thick, tardily dehiscent ....252. **Millettia.**

¶ Pod indehiscent :—[p. 107]

Pod not segmented :—

Leaves odd-pinnate :—

Trees or shrubs ; margins of leaflets entire :—

Leaflets opposite :—

Pod wingless ....253. **Pongamia.**

Pod winged ....254. **Derris.**

Leaflets alternate :—

Flowers small ; pods narrow ......255. **Dalbergia.**

Flowers medium ; pods suborbicular 256. **Pterocarpus.**

Herbs ; margins of leaflets with the main-veins produced as teeth ; leaves 3-foliolate :—

Pod subglobose, hardly longer than calyx 257. **Melilotus.**

Pod flattened, much longer than calyx 258. **Trigonella.**

Leaves even-pinnate :—

Rachis of leaf ending in a bristle ; herbs with hypogæal fruits ; stamens 9–10 ....260. **Arachis.**

Rachis of leaf not ending in a bristle ; large trees with pulpy pods ; stamens 3 ....283. **Tamarindus.**

Pod of several muricate 1-seeded segments ; anthers dimorphous ; leaves digitately 2–4-foliolate ...261. **Zornia.**

§Plants with hairs on twigs leaves and calyx fixed by their centre ; pod thick ; leaflets 3, large, toothed [p. 107] 273. **Cyamopsis.**

‡Carpels more than one, free or connate in a syncarpous ovary:— [p. 107]

Styles free or if connate at base (*Sterculia*, *Cardiospermum*) the stigmas free and radiating:—

Leaves twice ternate ....190. **Cardiospermum.**

Leaves simply pinnate, 3-foliolate, or digitate:—

Carpels free as well as styles; fruit of one or more follicles; leaves pinnate or 3-foliolate; perianth 2-seriate:—

Calyx accrescent, clasping base of sessile follicle 214. **Rourea.**

Calyx not accrescent, clasping the stalk of the stipitate follicle ....215. **Connarus.**

Carpels connate, at least at first, only the styles completely or partially free:—

Leaves pinnate; styles quite free; fruit a berry; perianth 2-seriate ....130. **Averrhoa.**

Leaves digitate; styles connate at base; fruit a group of free follicles; perianth 1-seriate, petals absent...105. **Sterculia.**

Style simple or stigma sessile:—

Leaflets dotted with pellucid glands ....142. **Luvunga.**

Leaflets not pellucidly gland-dotted:—

÷Leaves pinnate:—[p. 110]

Stamens 5, anthers opposite the petals; ovules in each cell of the ovary solitary; petals valvate ....189. **Leea.**

Stamens usually 10, if 5 the anthers not opposite the petals; ovules in each cell of ovary usually 2 or more; petals usually imbricate or contorted, rarely valvate:—

⊙Seeds not winged:—[p. 110]

Leaflets coarsely serrate, rarely entire; fruit a drupe; seeds with fleshy albumen and thin cotyledons; ovules in each cell 1–2:—

Flower elongated; calyx 5-partite; petals imbricate; style long; disk annular; fruit with a single 1–5-celled stone ....154. **Melia.**

Flower globose; calyx 5-toothed; petals valvate; style rather short; disk cup-shaped; fruit containing 5 horny pyrenes..........................155. **Cipadessa.**

Leaflets entire; seeds with no albumen, cotyledons fleshy:—

††Ovules 1–2 in each cell; fruit either a capsule or a berry; seed arillate:—[p. 110]

*Fruit a capsule, dehiscence loculicidal:—[p. 110]

Flowers and staminal tube oblong or linear; style long :—

Anthers linear; disk short annular; ovules solitary in each cell of the ovary 156. **Chisocheton.**

Anthers short; disk cylindric, longer than the ovary; ovules 2 in each cell of ovary 157. **Dysoxylum.**

Flowers and staminal tube globose or turbinate; style short or 0 :—

Anthers included; filaments quite united; petals 3 ....158. **Amoora.**

Anthers exserted; filaments free towards apex; petals 4–5 ....159. **Heynea.**

*Fruit a berry; petals 5; anthers included; style 0 [p. 109]..160. **Aglaia.**

††Ovules 3–8 in each cell; fruit a large capsule; seeds large, thick, tessaroid, without arillus [p. 109] 162. **Carapa.**

⊙Seeds winged :—[p. 109]

Disk present; petals spreading; staminal tube wide :—

Petals oblong; staminal tube urceolate; disk narrow annular; seeds albuminous, winged only at upper end ....163. **Swietenia.**

Petals obovate; staminal tube cupular; disk rather wide; seeds without albumen, winged at both ends 164. **Soymida.**

Disk 0; petals oblong, suberect; staminal tube cylindric; seeds without albumen, winged only below 165. **Chickrassia.**

÷Leaves digitate [p. 109]......................104. **Eriodendron.**

†Leaves simple or 1-foliolate :—[p. 107]

‡Leaves parallel-veined :—[p. 111]

Leaves distichous with a large stem-clasping sheath and a transverse ligule at junction of sheath and blade; blade articulate with sheath; perianth rudimentary; flowers in spikelets; bamboos :—

Spikelets many-flowered; paleas all 2-keeled 1117. **Gigantochloa.**

Spikelets few-flowered; pale of upper flowers absent, or if present glume-like and not keeled ....1118. **Oxytenanthera.**

Leaves with leaf-sheath small or absent; blade not articulate with sheath; perianth conspicuous, 2-seriate; flowers not in spikelets :—

Leaves apical, large, flabellate-plicate, lobes with induplicate sides and parallel veins, the apex of leaf-stalk liguliform; perianth 2-seriate 3-merous; palms; flowers in spadices 984. **Livistona.**

Leaves not flabellate; flowers not in spadices:—

Perianth 2-seriate 3-merous, stamens 6; leaves all radical:—

Leaves firm, subplicately nerved; flowers small, racemed on a solid slender firm scape with scarious bracts; rhizome wiry ....946. **Peloisanthes.**

Leaves herbaceous, not plicate; flowers capitate, umbellate, or solitary, on a fistular scape with apical involucre of 1 or more membranous bracts; rootstock a tunicated bulb:—

Ovary superior; flowers small..................969. **Allium.**

Ovary inferior; flowers large ....956. **Pancratium.**

Perianth 2-seriate 2-merous, stamens 4; stem leafy; leaves usually opposite or whorled ....959. **Stemona.**

†Leaves reticulately veined:—[p. 110]

§Leaves alternate:—[p. 113]

¶Perianth 2-seriate, both calyx and corolla present:—[p. 112]

*Flowers regular or nearly so:—[p. 112]

Leaves pellucidly glandular-punctate; sepals connate 144. **Atalantia.**

Leaves not glandular-punctate:—

=Sepals free; stamens not opposite the petals:—[p. 112]

Sepals imbricate; styles free ....127. **Geranium.**

Sepals valvate, or (*Xanthium*) absent:—

Petals connate in a tubular corolla with inflated 5-toothed limb ....465. **Xanthium.**

Petals free or only faintly connate at the base:—

÷Petals flat:—[p. 112]

Petals deciduous:—

Anther-cells divaricate; seeds wingless:—

Ripe carpels membranous 106*. **Kleinhovia.**

Ripe carpels firm ....107. **Helicteres.**

Anther-cells parallel; seeds winged 108. **Pterospermum.**

Petals persistent:—

Anthers 15, in 5 groups of 3 which alternate with 5 staminodes ....110. **Pentapetes.**

Anthers 5, staminodes 0:—

Ovary 5-celled ....111. **Melochia.**

Ovary of 1 carpel ....112. **Waltheria.**

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÷ Petals concave at base, appendaged at tip; anthers marginal, 1-seriate, alternating with staminodes:—[p. 111]

Anthers in groups of 2–4 between each pair of staminodes:—

Petals with a clawed ovate blade; capsule 5-angled and 5-winged.........113. **Abroma.**

Petals with a linear 2-fid blade; capsule globular, tubercled ....114. **Guazuma.**

Anthers solitary between each pair of staminodes; petals 2-fid; capsule prickly 115. **Buettneria.**

= Sepals connate; stamens opposite petals [p. 111] 189. **Leea.**

*Flowers irregular:—[p. 111]

Petals united in an oblique, 2-lipped corolla, with 2-partite upper and 3-lobed lower lip........................505. **Lobelia.**

Petals not connate in a tube:—

Stamens 8 or fewer; lowest petal (keel) largest; sepals free; anthers opening by pores:—

Fruit a 2-celled loculicidal capsule; herbs or erect shrubs or undershrubs:—

Stamens 8; two inner sepals wing-like, petaloid 62. **Polygala.**

Stamens 4–5; sepals all subequal, petaloid 61. **Salomonia.**

Fruit a 1-celled, 1-seeded indehiscent samara; stamens 8 ....63. **Securidaca.**

Stamens 10; uppermost petal (standard) largest, lowest two petals united (keel); sepals connate: anthers not opening by pores; fruit a 1-celled pod:—

Leaves pellucidly glandular-punctate ...272. **Psoralea.**

Leaves not glandular-punctate:—

Pods compressed; seeds 1–2 ....222. **Heylandia.**

Pods turgid; seeds many ....223. **Crotalaria.**

¶ Perianth 1-seriate:—[p. 111]

Erect trees or shrubs; perianth-segments valvate; anthers at the top of a staminal column:—

Anthers several-seriate; ovary with cells 2–more-ovuled 105. **Sterculia.**

Anthers 1-seriate; ovary with cells 1-ovuled 106. **Heritiera.**

Climbing shrubs, or erect, prostrate or climbing herbs; perianth-segments connate throughout or imbricate:—

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Armed climbing woody shrubs, with recurved spines; perianth completely tubular, plicate in bud; flowers in threes in the axils of large coloured petaloid bracts; stamens 6–8 ....764. **Bougainvillea.**

Unarmed erect or climbing plants with usually herbaceous stems; perianth segments imbricate:—

Perianth petaloid, segments very large; climbers with rachis of inflorescence produced as tendrils; stamens 7–8 789. **Antigonon.**

Perianth scarious or rarely herbaceous, segments small; erect, or if climbing, without tendrils; stamens 5 or 4:—

Ovary 2–more-ovuled:—

Fruit a berry; perianth herbaceous; shrubby, often climbing ....766. **Deeringia.**

Fruit membranous; perianth scarious, often coloured; erect herbs ....767. **Celosia.**

Ovary 1-ovuled:—

Ovules erect; flowers capitate; staminodial filaments 0 ....768. **Allmania.**

Ovules suspended from a basal funicle; flowers spicate; staminodial filaments interposed between the fertile stamens ....774. **Ærua.**

§Leaves opposite; rarely leaves 0:—[p. 111]

‡Perianth 2-seriate; both calyx and corolla present; corolla always gamophyllous; carpels 2 free, only the styles united; pollen aggregated in waxy masses (pollinia):—[p. 116]

Pollen-masses in pairs in each cell (20 in all), sessile in fours (2 pairs) on the corpuscles; anthers with membranous inflexed tips; corolla rotate, lobes valvate 570. **Genianthus.**

Pollen-masses solitary in each cell (10 in all), sessile or peduncled in pairs on the corpuscle:—

†Pollen-masses pendulous from the tip or side of the corpuscle below the edge of the stigma; anthers with a membranous inflexed apex; seeds with coma:—[p. 114]

Corona double, the outer annular attached to the corolla, the inner of 5 free, ligulate scales adnate to the back of the stamens; corolla wide rotate-campanulate, angularly 5-lobed; stems twining ....571. **Oxystelma.**

Corona single or, if double, the outer as well as the inner attached to the stamens:—

⊙Stems leafy erect or climbing, not jointed:—[p. 114]

Stems erect; corolla-lobes valvate; corona single of 5 processes adnate to the back of the stamens:—

Corolla wide-campanulate; coronal processes radiating from the staminal column, laterally compressed and spurred on the back...572. **Calotropis.**

Corolla rotate; coronal processes erect, spoon-shaped, and ligulate on the face...573. **Asclepias.**

Stems twining; corolla-lobes overlapping:—

Corona annular single, fleshy, truncate, attached to base of 10-ribbed staminal tube 574. **Holostemma.**

Corona double an outer annular, membranous, lobed, and an inner of 5 processes, or, if single, (*Raphistemma* and sometimes *Pentatropis*) then not annular:—

Processes of inner corona free from smooth staminal tube; outer corona with 5 distinct lobes opposite the anthers and with a scale or ligule (inner corona) adnate to face of each lobe; corolla campanulate or subrotate 575. **Cynanchum.**

Processes of inner (or only) corona adnate to staminal tube:—

Processes of the solitary corona ligulate; corolla campanulate ......576. **Raphistemma.**

Processes of inner or only corona compressed, often spurred on the back; corolla rotate or funnel-shaped:—

Outer corona minute or absent; if present 5–10-lobed with the longer or only lobes opposite the anthers ......577. **Pentatropis.**

Outer corona conspicuous, always present, 5–10-lobed with the larger or only lobes alternate with the anthers ...578. **Dæmia.**

⊙Stems leafless, jointed, trailing; corolla subrotate, lobes overlapping; corona double, outer annular, membranous, 10-lobed; inner of 5 processes joining the outer to the back of the stamens [p. 113] 579. **Sarcostemma.**

†Pollen-masses erect, parallel with or rising above the edge of the stigma, if horizontal or pendulous (rarely in *Tylophora*) still with an erect pedicel:—[p. 113]

÷Anthers with a membranous inflexed apex, if obtuse (rarely in *Hoya*) then with large stellate single corona, rotate corolla and free petal tips :—[p. 116]

Corona 0; fruits globose; seeds large without coma; corolla-lobes overlapping to the right...580. **Sarcolobus.**

Corona present, or if (sometimes in *Stephanotis*, rarely in *Marsdenia*) absent, then fruit not globose, and seeds provided with a coma :—

Corona adnate to corolla-tube; lobes of corolla overlapping to the right ....581. **Gymnema.**

Corona adnate to the staminal tube or to the anthers :—

*Corolla-lobes overlapping to the right, or if subvalvate (*Tylophora* sometimes), then with stamens inserted in the throat or tube of the corolla :—[p. 116]

Stamens arising from the base of the corolla :—

Scales of corona minute, attached to base of staminal tube; flowers urceolate or wide-campanulate, small.........582. **Gongronema.**

Scales of corona conspicuous, attached above the base of the staminal tube, rarely 0 :—

Corolla large (1 in. long or longer), white, salver-shaped or funnel-shaped; scales of corona erect, attached to back of anthers, sometimes absent ....583. **Stephanotis.**

Corolla medium (·5 in. long or less) :—

Scales of corona erect :—

Coronal scales attached to staminal tube and back of anthers, rarely absent; flowers purplish or greenish, campanulate or urceolate ......584. **Marsdenia.**

Coronal scales attached only to staminal tube, free above; flowers yellow or orange, salver-shaped

585. **Pergularia.**

Scales of corona stellately spreading, thick and fleshy, attached to staminal tube; flowers green, rotate...586. **Dregea.**

Stamens arising from throat or tube of corolla; scales of corona laterally compressed, fleshy, attached to staminal tube, more or less spread-

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ing; flowers small subrotate, sometimes almost valvate ....587. **Tylophora.**

*Corolla-lobes absolutely valvate, the stamens arising from the base of the corolla; coronal scales attached to staminal tube:—[p. 115]

Scales of corona erect, membranous; corolla urceolate ....588. **Dischidia.**

Scales of corona stellately spreading, thick and fleshy; corolla rotate; anthers rarely without a membranous tip ....589. **Hoya.**

÷Anthers without a membranous inflexed tip; corona double, the outer annular 5–10-lobed attached to staminal tube, inner of 5 scales opposite anthers attached to face outer; stamens attached to base of corolla; corolla tubular with subglobose base and valvate lantern-shaped limb, the lobes cohering at their tips; stems twining; seeds with coma [p. 115].........590. **Ceropegia.**

‡Perianth 1-seriate:—[p. 113]

Perianth tubular, corolline, constricted above the ovary, plicate in bud:—

Flowers large, involucrate, bracts connate; stamens 5–6 762. **Mirabilis.**

Flowers small, paniculate or umbellate, bracteolate; stamens 1–5 ....763. **Boerhaavia.**

Perianth of scarious, imbricate, free or nearly free whitish or coloured sepals:—

Anthers 2-celled:—

Flowers all perfect:—

Stamens with interposed staminodial filaments:—

Sepals hyaline, woolly.........................774. **Ærua.**

Sepals spinescent......................775. **Achyranthes.**

Staminodes 0 ....773. **Psilotrichum.**

Flowers clustered, 1–3 perfect, surrounded by deformed ones:—

Stamens with interposed staminodial filaments 771. **Cyathula.**

Staminodes 0.....................................772. **Pupalia.**

Anthers 1-celled:—

Staminal-tube short; stigma capitate, subsessile 776. **Alternanthera.**

Staminal-tube long; stigma 2-fid, style long 777. **Gomphrena.**

Stamens indefinite, 20 or more than 20 :—[p. 107]

Leaves opposite, simple, glandular-punctate ; sepals imbricate 75. **Hypericum.**

Leaves alternate, not glandular-punctate :—

§Leaves simple :—[p. 118]

Ovary inferior, 2–more-celled ; petals imbricate :—

Stamens all perfect ; fruit angular, fibrous, 1-seeded ; sepals valvate or imbricate ....337. **Barringtonia.**

Stamens not all perfect, those of inner or of outer series or both without anthers ; fruit ovoid or globular, fleshy ; seeds many 336. **Careya.**

Ovary superior, 2–more-celled :—

Anthers 2-celled :—

Sepals passing gradually from bracts, imbricate ; petals imbricate ....83. **Camellia.**

Sepals valvate in a calyx at first spathaceous ; petals contorted ....109. **Eriolæna.**

Anthers 1-celled :—

†Carpels when ripe separating from the axis as dehiscent or indehiscent cocci :—[p. 118]

Styles as many as the carpels :—

Bracteoles 3 ; ripe carpels after separating indehiscent, 1-seeded ; ovules solitary ascending :—

Stigmas linear, carpels many ....90. **Malva.**

Stigmas capitate, carpels 8–12.........91. **Malvastrum.**

Bracteoles 0 ; ripe carpels after separating dehiscent :—

Carpels without a false dissepiment :—

Ovules solitary pendulous ; carpels 1-seeded ; forenoon- and noon-flowering plants with small leaves and flowers...92. **Sida.**

Ovules 2 or more ; carpels 1- or more-seeded ; afternoon- or evening-flowering plants with rather large leaves and medium flowers...............93. **Abutilon.**

Carpels with a transverse false dissepiment 94. **Wissadula.**

Styles twice as many as the carpels ; carpels 1-seeded :—

Carpels opposite sepals ; indehiscent after separating ; bracteoles 10 ....95. **Pavonia.**

Carpels opposite petals ; indehiscent after separating :—

¶Bracteoles 5, connate ; carpels spinescent or unarmed ; flowers pink [p. 118]..................96. **Urena.**

¶Bracteoles intermixed with flowers, or 0; flowers in dense heads, white or yellow; carpels unarmed [p. 117] 97. **Malachra.**

†Carpels when ripe forming a capsule :—[p. 117]

Stigmas spreading; seeds reniform :—

Ovary 3-celled; ovules 2 in each cell, ascending; flowers panicled, polygamous; small trees……………98. **Kydia.**

Ovary 5-celled; sometimes spuriously 10-celled from false dissepiments; cells opposite sepals, 3- or more-ovuled; flowers axillary ……………………………99. **Hibiscus.**

Stigmas cohering in a club-shaped mass :—

Bracteoles 3, large, cordate; seeds cottony 100. **Gossypium.**

Bracteoles 3-5, small; seeds not cottony 101. **Thespesia.**

§Leaves compound :—[p. 117]

Leaves digitate; petals contorted; flowers large; fruit large; ovary 5-celled :—

Calyx 5-cleft; fruit oblong, woody, indehiscent; seeds not packed in cotton; staminal tube long; flowers white 102. **Adansonia.**

Calyx truncate or irregularly toothed; fruit ovoid, dehiscent; seeds packed in cotton; staminal tube short; flowers (in our species) red ……………………………………103. **Bombax.**

Leaves equally twice pinnate; petals valvate; flowers small; fruit a pod; ovary of 1 carpel :—

Pod not septate between the seeds :—

Pod straight, with thin valves :—

Sutures thin; pod indehiscent, or if dehiscent the valves not opening elastically…………………………302. **Albizzia.**

Sutures thickened; pod revolutely dehiscent, the valves opening elastically from apex to base ……303. **Calliandra.**

Pod twisted, with coriaceous valves ……304. **Pithecolobium.**

Pod septate between the seeds, indehiscent; valves spongy or fleshy; sutures thickened …………………305. **Enterolobium.**

Class XVII. DIADELPHIA.

Stamens 6, in two antero-posterior bundles of 3 each ……38. **Fumaria.**

Stamens 10, in an anterior bundle of 9 with a posterior single stamen or in two lateral bundles of 5 each :—

Plants with basifixed hairs or glabrous; anthers not mucronate or gland-tipped :—[p. 122]

†Pod dehiscent by both sutures :—[p. 121]

Leaf-rachis ending in a bristle or tendril; leaflets even-pinnate stipules large, foliaceous, oblique at base; stamens 9+1 :—

Style not bearded; wings free from staminal sheath; leaflets toothed; seeds with a slender funicle; pod turgid ...216. **Cicer.**

Style bearded; wings more or less adnate to staminal sheath; leaflets entire; seeds with short funicle :—

Staminal sheath oblique at the mouth; pod compressed :—

Style with a dorsal tuft of hairs or bearded round tip; ovules usually more than 2 ....217. **Vicia.**

Style longitudinally bearded along inner face; ovules never more than 2..218. **Lens.**

Staminal sheath truncate at mouth; style bearded along the inner face :—

Pod compressed; style flat, dilated at tip...219. **Lathyrus.**

Pod turgid; style 3-cornered, dilated upwards throughout 220. **Pisum.**

Leaf-rachis bearing a terminal leaflet; leaves odd-pinnate or simple or 1-foliolate or digitately compound :—

Leaves digitately 3-foliolate or petioled 1-foliolate, glandular beneath :—

Pod turgid; leaves digitately 3-foliolate with bracts small, or 1-foliolate with bracts large; funicle centric 224. **Flemingia.**

Pod depressed between the seeds; leaves (in our species) 1-foliolate with bracts small; funicle attached near end of hilum ....225. **Eriosema.**

Leaves pinnately compound, rarely 1-foliolate :—

‡Leaves 3-foliolate, or if 1-foliolate (*Grona*) with the leaves not glandular beneath :—[p. 121]

§Pods dehiscing from apex to base :—[p. 121]

¶Leaves glandular beneath; pod compressed; the 2 upper calyx-lobes connate; funicle centric :—[p. 120]

Ovules 1–2 :—

Calyx-lobes accrescent, scariously membranous, the lowest lobe largest ....226. **Cylista.**

Calyx-lobes not accrescent, or if accrescent subequal and not scarious.......................227. **Rhynchosia.**

Ovules 4 or more :—

**Climbers; stigma small terminal :—[p. 120]

Pod linear-acuminate, hardly depressed between the seeds ....228. **Dunbaria.**

Pod oblong-obtuse, deeply transversely lineate between the seeds ....229. **Atylosia.**

Woody shrubs or undershrubs; stigma dilated, oblique; pod acute, deeply transversely lineate between the seeds [p. 119] ....230. **Cajanus.

¶ Leaves not glandular beneath; leaflets stipellate:—[p. 119]

Style bearded below the stigma:—

Pod woody, septate between the velvety seeds; stigma oblique ....231. **Dysolobium.**

Pod coriaceous, not septate between the smooth seeds:—

Stigma oblique:—

Keel spirally twisted...............232. **Phaseolus.**

Keel not spiral:—

Style filiform..........................233. **Vigna.**

Style flattened upwards ...234. **Pachyrhizus.**

Stigma terminal ....235. **Dolichos.**

Style not bearded below the stigma:—

Nodes of rachis of racemes not swollen:—

Calyx-tube cylindric with oblique truncate mouth; style dilated in the middle; standard erect 237. **Dumasia.**

Calyx-tube campanulate, margin toothed; the 2 upper teeth subconnate; style uniform; standard reflexed; stamens at first 1-adelphous...238. **Glycine.**

Nodes of rachis of racemes swollen:—

Petals of equal length:—

Leaves 3-foliolate:—

Petals far exserted; stamens usually more or less monadelphous ....242. **Pueraria.**

Petals little exserted; upper lobe of calyx entire ....243. **Galactia.**

Leaves 1-foliolate; upper lobe of calyx 2-toothed 244. **Grona.**

Petals very unequal:—

Anthers uniform; keel and wings both shorter than standard; armed trees; stamens often submonadelphous.................245. **Erythrina.**

Anthers dimorphous; standard shorter than keel and wings; climbers ....246. **Mucuna.**

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§Pods dehiscing at seed-bearing apex only, elsewhere seedless and indehiscent :—[p. 119]

Petals very unequal ; flowers large ....247. **Butea.**

Petals nearly equal ; flowers small ...248. **Spatholobus.**

‡Leaves pinnately 5-many-foliolate ; pods dehiscing from apex to base :—[p. 119]

Style bearded below the stigma ; flowers with very unequal petals, standard large ....249. **Clitoria.**

Style not bearded ; flowers medium, the standard not longer than the other petals :—

Pod transversely septate between the seeds ; stamens truly diadelphous ....250. **Sesbania.**

Pod not septate ; stamens sub-1-adelphous, the vexillary stamen being united by its middle to the sheath :—

Leaflets closely parallel-veined ; pod thin, early dehiscent ....251. **Tephrosia.**

Leaflets reticulately veined ; pod thick, tardily dehiscent ....252. **Millettia.**

†Pod indehiscent or rarely (*Desmodium* sometimes) opening along the ventral suture :—[p. 119]

††Leaves not pellucidly gland-dotted :—[p. 122]

Pod not segmented ; always indehiscent :—

Leaves odd-pinnate :—

Trees or strong woody climbers ; leaflets entire :—

Leaflets opposite ; stamens usually sub-1-adelphous :—

Pod wingless ....253. **Pongamia.**

Pod winged ....254. **Derris.**

Leaflets distinctly alternate :—

Flowers small, pods narrow ....255. **Dalbergia.**

Flowers medium, pods suborbicular 256. **Pterocarpus.**

Herbs ; leaflets with the veins produced as marginal teeth ; leaves always 3-foliolate :—

Pods subglobose, hardly longer than calyx 257. **Melilotus**

Pods flattened, much longer than calyx :—

Pod straight or curved, not spiral 258. **Trigonella.**

Pod spirally twisted ....259. **Medicago.**

Pods of 1 or several indehiscent 1-seeded segments ; in some *Desmodia* dehiscing along the ventral suture :—

‡‡Leaves exstipellate :—[p. 122]

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Stamens 9 in a sheath slit above, with a free vexillary stamen; leaves 1–3-foliolate:—

Stipules spinescent; leaves always simple; joints of pod hardly separating; vexillary stamen always free 262. **Alhagi.**

Stipules not spinescent; leaves usually 3-foliolate, rarely 1-foliolate; pod a solitary, 1-seeded, flattened segment; vexillary stamen sometimes partially united to sheath 263. **Lespedeza.**

Stamens in 2 bundles of 5 each; leaves pinnate; joints of pod papillose or weakly muriculate:—

Leaves even-pinnate, end leaflet replaced by a bristle; pod folded together within the calyx.........264. **Smithia.**

Leaves odd-pinnate; pod straight, exserted; marsh plants 265. **Æschynomene.**

‡‡Leaves stipellate; stamens 9 and 1, occasionally submonadelphous; joints of pod about as long as broad:—[p. 121]

Ovary 1-ovuled; leaves 1-foliolate...............266. **Eleiotis.**

Ovary 2–more-ovuled:—

Pod folded together within the calyx:—

Calyx-teeth setaceous, not accrescent ......267. **Uraria.**

Calyx-teeth lanceolate, accrescent ....268. **Lourea.**

Pod straight, exserted:—

A tree; joints of pod thin, wing-like, large; flowers in fascicles from old wood: stamens dimorphous 269. **Ougeinia.**

Herbs, rarely shrubs; joints of pod not wing-like; flowers from the year's shoots; stamens uniform:—

Joints of pod thin, or, if coriaceous, broader than thick; if as thick as their width much longer than broad; sometimes opening along lower suture 270. **Desmodium.**

Joints of pod coriaceous, about as thick as they are broad and long ....271. **Alysicarpus.**

††Leaves pellucidly gland-dotted; leaflets (in our species) solitary, their margins toothed; stamens sub-1-adelphous; ovule solitary; pod indehiscent [p. 121] ....272. **Psoralea.**

*Plants with hairs on twigs, leaves and calyx fixed by their centres; connective of anthers mucronate or gland-tipped; leaves simple or compound [p. 119] ....274. **Indigofera.**

Class XVIII. POLYADELPHIA.

Leaves compound, odd-pinnate, with alternate leaflets not gland-dotted; carpel solitary; fruit an indehiscent orbicular pod; stamens 10 256. **Pterocarpus.**

Leaves simple or 1-foliolate, gland-dotted; carpels several, connate in a 2-more-celled ovary; stamens 20 or more:—

Ovary superior:—

Leaves opposite:—

Fruit a 3-valved capsule ....76. **Cratoxylon.**

Fruit a berry ....80. **Garcinia.**

Leaves alternate, 1-foliolate, petiole winged; fruit indehiscent with leathery rind ....147. **Citrus.**

Ovary inferior:—

Leaves alternate or opposite; flowers in heads or spikes; fruit a 3-valved capsule ....331. **Melaleuca.**

Leaves opposite; flowers never in heads or spikes; fruit a small or large berry ....335. **Eugenia.**

Class XIX. SYNGENESIA.

Ovary superior, 5-celled; ovules in each cell 2 or more; flowers large, not aggregated in heads:—

Lateral petals connate in pairs; fruit capsular ....131. **Impatiens.**

Lateral petals free; fruit a fleshy drupe..................132. **Hydrocera.**

Ovary inferior, 1-celled, 1-ovuled; flowers almost always small and aggregated in heads:—

*Corollas of all the flowers tubular to near the mouth, or if any flatly expanded from a tubular base (ligulate) then only the marginal florets of the flower-head (ray-florets) so expanded; sap not milky:—[p. 130]

†Style-arms long, distinct, or if very short or the style subentire then so only in the sterile florets of heads with dissimilar (heterogamous) florets:—[p. 129]

‡Flowers red, purple or white, never yellow; all the florets similar (homogamous) and tubular or rarely (*Elephantopus*) cleft laterally; involucre of bracts always more than 1-seriate, pappus present, usually setaceous or rarely (*Ethulia*) absent; receptacle naked or rarely (*Ageratum*) paleaceous:—[p. 124]

‡‡Anthers cleft at base and appendaged at apex; style-arms subulate, hairy; leaves alternate:—[p. 124]

§§Heads distinct; many-flowered:—[p. 124]

Pappus absent; achenes 4–5-angled ....438. **Ethulia.**

Pappus present; achenes 10-ribbed:—

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Pappus short, fugacious ....439. **Centratherum.**

Pappus long, copious..........................440. **Vernonia.**

§§Heads 1- or few-flowered but crowded into dense masses resembling single heads; pappus chaffy [p. 123] 441. **Elephantopus.**

‡‡Anthers subentire at base, either truncate or appendaged at apex; style-arms obtuse, papillose; leaves opposite :—[p. 123]

Anthers truncate at tip.......................442. **Adenostemma.**

Anthers appendaged at tip :—

Pappus paleaceous; receptacle sometimes paleaceous 443. **Ageratum.**

Pappus of slender hairs; receptacle always naked :—

Bracts of involucre numerous, several-seriate 444. **Eupatorium.**

Bracts of involucre 4, with sometimes a small outer one 445. **Mikania.**

‡Flowers, if similar (homogamous) and tubular, yellow; if dissimilar (heterogamous) at least those of the disk yellow; or if none of the flowers yellow (*Lagascea*, *Emilia*) then with the bracts of the involucre only 1-seriate; rarely (some *Inuloideæ*) flowers purple with bracts many-seriate, but if so with the heads at least heterogamous :—[p. 123]

§Anthers appendaged at the apex :—[p. 129]

¶Receptacle naked, smooth or foveolate; sometimes when foveolate the edge of the pit fimbriate but not beset with proper paleæ; if paleaceous (*Athroisma*) or pseudo-paleaceous (*Cæsulia*) then with the anther-bases produced into tails :—[p. 126]

**Bracts of the involucre many-seriate; leaves alternate :—[p. 126]

††Anthers subentire at the base; style-arms flattened or plano-convex, all, or at least those of the disk-florets, tipped by a cone; all the flower-heads heterogamous :—[p. 125]

Flower-heads without a proper ray; pappus hardly any or altogether absent :—

Achenes minute, oblong, smooth; pappus absent 446. **Cyathocline.**

Achenes flattened or subterete with a terminal toothed or bristly pappus-ring.....................447. **Grangea.**

Flower-heads with distinct ray-florets :—

÷Ray-florets ligulate, never yellow, ligules 2–3-seriate; pappus long, copious [p. 125] ...448. **Erigeron.**

÷Ray-florets slender, tubular or with very short ligules, yellow like those of disk:—[p. 124]

Pappus long, copious....................449. **Conyza.**

Pappus short, scanty ....450. **Thespis.**

††Anthers cleft at the base or rarely (*Laggera*) with bases subentire and, if so, with the style-arms of the hermaphrodite florets filiform; style-arms filiform, linear or obtuse or those of the sterile florets undivided:—[p. 124]

*Female florets, if present, filiform:—[p. 126]

Style-arms of hermaphrodite florets filiform; flower-heads androgynous:—

Receptacle naked; bracts of the involucre linear, herbaceous or scarious:—

Flower-heads medium, separate, solitary, in corymbs or panicles, not in globose clusters; or, if clustered (some *Blumeas*) then the achenes with a copious soft pappus:—

Pappus copious, of soft or bristly hair:—

Herbs; bracts of involucre narrow; flowers not corymbose:—

Anther-cells tailed at the base, the tails of adjacent anthers confluent 451. **Blumea.**

Anther-cells subentire at base, or, if tailed, the tails short and not united 452. **Laggera.**

Shrubs; bracts of the involucre broad; flowers corymbose...............453. **Pluchea.**

Pappus absent or represented by only 1–2 rigid scales or bristles....................454. **Epaltes.**

Flower-heads small, in dense globose or ovoid masses; herbs with winged stems; pappus absent 455. **Sphæranthus.**

Receptacle with paleaceous scales; female florets enclosed in the long outer scales of the receptacle or in the inner bracts of the involucre; flower-heads aggregated in dense terminal clusters or short spikes ....456. **Athroisma.**

Style-arms of hermaphrodite florets truncate; bracts of the involucre hyaline:—

‡‡Flower-heads many-flowered; heads heterogamous disciform; receptacles naked; hoary or woolly herbs [p. 126]...........457. **Gnaphalium.**

‡‡Flower-heads 1-flowered; heads homogamous, crowded in pseudo-paleaceous axillary common receptacles, the bracts of the involucres of individual heads simulating paleæ; glabrous marsh herbs [p. 125]..............................458. **Cæsulia.**

*Female florets, if present, ligulate; heads heterogamous but florets usually all fertile with linear style-arms, rounded or dilated at their tips; receptacle naked:—[p. 125]

Achenes faintly ribbed; flowers usually rayed; pappus-hairs all slender, those of ray-florets few or none 459. **Vicoa.**

Achenes distinctly ribbed; flowers either rayed or discoid; pappus of outer florets scaly, of inner florets hair-like ....460. **Pulicaria.**

**Bracts of the involucre 1-seriate, subequal, free or united, with sometimes a few short outer bracts (calycule) at their base; heads heterogamous or homogamous; anther-cells subentire at the base; receptacle naked:—[p. 124]

Leaves alternate; pappus of fine hairs, usually soft and generally copious; style-arms of hermaphrodite florets truncate or obtuse, penicillate or with a hairy tip:—

Heads all homogamous; florets (in our species) all purple ....461. **Emilia.**

Heads rayed, heterogamous; florets all yellow 462. **Senecio.**

Leaves opposite; pappus paleaceous or absent; style-arms truncate, penicillate or not, or shortly appendaged at tip; heads heterogamous:—

Pappus absent; leaves entire or dentate; heads very small, ray sometimes absent...............463. **Flaveria.**

Pappus present; leaves pinnatisect; heads large, flowers showy ....464. **Tagetes.**

¶Receptacle paleaceous; anthers subentire at base; bracts of the involucre 1-many-seriate; heads usually radiate, heterogamous; style-arms truncate or appendaged or those of the sterile florets entire; pappus of 2-4 arms, or paleaceous, or absent; leaves at the base usually opposite, those higher up opposite or alternate:—[p. 124]

Heads 1-flowered, in globose clusters; bracts of the involucre forming a 5-fid tube; lower or all the leaves opposite; villous herbs ....466. **Lagascea.**

Heads many-flowered;—

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§§Pappus consisting of only 1–4 bristly awns, or cup-like, or absent:—[p. 128]

Corollas of the fertile florets persistent on the achenes; pappus of 1–3 awns; leaves opposite……467. **Zinnia.**

Corollas of all the florets deciduous:—

‡Achenes all thick, or those of the ray-florets 3-cornered and those of the disk laterally compressed; pappus cup-like or composed of 2–3 stiff chaffy or bristly awns with or without intermediate smaller scales or altogether absent; leaves usually opposite:—[p. 128]

Inner bracts of the involucre embracing and enclosing the achenes of the fertile ray-florets; pappus absent:—

Outer bracts of the involucre 5, glandular . 468. **Siegesbeckia.**

Outer bracts of the involucre 4, in two opposite pairs, glabrous …………………469. **Enhydra.**

Inner bracts of the involucre all flat:—

Scales of the receptacle flat, very narrow, usually few; disk-florets 4-toothed; ligules small; pappus absent or, if present, shortly 2-awned; outer bracts of the involucre numerous…470. **Eclipta.**

Scales of the receptacle concave or complicate, more or less enclosing and embracing the disk-florets:—

††Achenes wingless, compressed or 4–5-cornered:—[p. 128]

Pappus united at the base into a ring or cup; flower-heads small or medium; ray-florets fertile:—

Ray-florets white, with small ligules; disk-achenes with 2–5 persistent awns; leaves opposite, at least below 471. **Blainvillea.**

Ray-florets yellow, ligules large; disk-achenes with 1–2 short deciduous awns; leaves all opposite ………472. **Wedelia.**

Pappus-scales or awns free from the base; flower-heads large, ray-florets sterile:—

¶¶Awns of the pappus deciduous or persistent, intermediate scales present, persistent; leaves always alternate [p. 128]

473. **Tithonia.**

¶¶Awns of the pappus deciduous, often paleaceous, without intermediate scales; leaves alternate or opposite [p. 127]
474. **Helianthus.**

††Achenes of the disk ciliate or winged on the margins, laterally compressed; heads small; leaves always opposite [p. 127]
475. **Spilanthes.**

‡Achenes more or less depressed from the top; pappus of 2, rarely 3–4 bristles, or absent :—[p. 127]

Outer bracts of the involucre almost equal, herbaceous; inner bracts separate, almost resembling the scales of the receptacle; ray-florets fertile, leaves opposite :—

Achenes almost 4-cornered, without a pappus, but crowned by the densely pilose base of corolla
476. **Guizotia.**

Achenes flat, margins lacerate and winged; pappus present, composed of bristles
477. **Synedrella.**

Outer bracts of the involucre few, small; inner bracts connate below, membranous :—

Style-arms truncate, penicillate or crowned by a short appendage :—

Leaves alternate, pinnatisect; ray-florets fertile; achenes narrow, flat, long-ciliate with two stiff smooth ultimately recurved awns
478. **Glossocardia.**

Leaves opposite, simple to pinnatisect, ray-florets sterile; achenes with 2–4 stiff arms ultimately finely serrulate on inner side :—

Achenes more or less beaked 479. **Cosmos.**

Achenes not beaked ....480. **Bidens.**

Style-arms ending in a long, shortly hairy appendage; ray-florets fertile :—

Achenes long, crowned with 2–3 stiff persistent bristles; leaves mostly radical
481. **Glossogyne.**

Achenes without awns; leaves mostly cauline, scattered ....482. **Chrysanthellum.**

§§Pappus of numerous scales; head radiate; leaves opposite:—[p. 127]

Scales of pappus oblong, chaffy; heads very small 483. **Galinsoga.**

Scales of pappus feathery, fringed; heads medium 484. **Tridax.**

§Anthers not appendaged at the apex; receptacles (in our species) not paleaceous; pappus absent or reduced to a raised rim, rarely scaly or short; leaves usually alternate:—[p. 124]

Flower-heads radiate; bracts of the involucre rather broad; pappus of short scales sometimes present 485. **Chrysanthemum.**

Flower-heads discoid, heterogamous; pappus absent:—

Florets of the circumference very numerous; achenes flat or concave at the top; flower-heads spherical or hemispherical:—

Heads peduncled; bracts of the involucre 1–2-seriate 486. **Cotula.**

Heads subsessile:—

Bracts of the involucre 2-seriate, spreading in fruit 487. **Centipeda.**

Bracts of the involucre 3–4-seriate, incurved in fruit 488. **Sphæromorphæa.**

Florets of the circumference few; achenes obovate or rounded at top; flower-heads very small, in racemes or panicles ....489. **Artemisia.**

†Style-arms very short, hairy or thickened towards the base, or the style subentire in all the florets, which are similar and tubular to the deeply 5-fid mouth; anther-cells always appendaged at the apex, either subentire or cleft at the base; receptacle usually paleaceous; leaves alternate, generally spinescent:—[p. 123]

Flower-heads 1-flowered, crowded into dense spherical balls; achenes inserted in the straight areoles of the receptacle, silky; leaves and bracts of the involucre spinescent, thistle-like 490. **Echinops.**

Flower-heads many-flowered, separate; achenes glabrous:—

¶Achenes inserted in the straight areoles of the receptacle:—[p. 130]

‡‡Leaves and bracts of the involucre spinescent, thistle-like; pappus-hairs connate at the base into a deciduous ring:—[p.130]

Filaments free, papillose-hairy; pappus-hairs feathery 491. **Cnicus.**

Filaments connate, glabrous; pappus-hairs simple 492. **Silybum.**

‡‡Leaves and bracts of the involucre unarmed; filaments free:—[p. 129]

Pappus-hairs 1-seriate, feathery or only a few of the outer ones simple; filaments glabrous ....493. **Saussurea.**

Pappus-hairs many-seriate, subpaleaceous; filaments hairy 494. **Goniocaulon.**

¶Achenes inserted in the very oblique or quite lateral areoles of the receptacle; leaves and bracts of the involucre spinescent:—[p. 129]

Bracts of the involucre without any whorl of outer leafy bracts (calycule); pappus many-seriate, bristly except the flattened innermost ....495. **Volutarella.**

Bracts of the involucre with a distinct whorl of spinescent leafy bracts at their base; pappus (in our species) wanting 496. **Carthamus.**

*Corollas of all the flowers flatly expanded from a tubular base (ligulate), ligules 5-toothed; anthers cleft at base, rarely appendaged at apex; leaves radical or alternate; stems always herbaceous, fistulose; sap milky:—[p. 123]

Pappus of scales with sometimes alternating hairs, or pappus absent; florets blue...497. **Cichorium.**

Pappus of hair-like bristles, at least in the central florets of the heads; florets yellow:—

Pappus-hairs feathery; achenes contracted at both ends, ribbed, rugose ....498. **Picris.**

Pappus-hairs simple:—

Achenes beaked and also contracted at the base, ribbed; ribs rugose or smooth:—

Achenes fusiform or oblong, rarely shortly cylindric, often slender, glabrous or puberulous ....499. **Crepis.**

Achenes compressed or flattened, ovoid-oblong or narrow 500. **Lactuca.**

Achenes not beaked:—

Achenes narrowed at the base, truncate at the apex:—

Achenes oblong with 4–5 rugose ribs.........501. **Picridium.**

Achenes compressed, many-ribbed; ribs smooth or rugose 502. **Sonchus.**

Achenes truncate at base as well as at apex......503. **Launea.**

Class XX. GYNANDRIA.

⊙Leaves with reticulate venation; ovary more or less completely 2–more-celled:—[p. 131]

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Perianth 1-seriate, tubular with inflated base then contracted, hairy within; limb dilated, obliquely 1–2-lipped; anthers 6; ovary with intruded or connivent placentas more or less completely 4–6-celled; shrubs or perennial herbs, often twining...............790. **Aristolochia.**

Perianth 2-seriate, calyx 5-lobed often somewhat 2-lipped; corolla gamopetalous, irregularly 2-lipped; anthers 2; ovary completely 2-celled; small erect herbs ....504. **Stylidium.**

⊙Leaves with parallel venation; ovary 1-celled with 3-parietal placentas; perianth 2-seriate, outer series 3, similar or nearly so, inner series 3 dissimilar, with two segments more or less like outer, and a third (lip) usually very different in shape and size:—[p. 130]

*Anther single:—[p. 135]

†Pollinia waxy:—[p. 134]

‡Pollinia free or those of each cell held together at the base by a viscid appendage, not attached by their bases or by a caudicle to the rostellum:—[p. 133]

§Pollinia 4:—[p. 132]

Leaves sessile, equitant, fleshy, congested on short, or distichous on elongated stems with the vaginal part much shorter than the main leaf; inflorescence terminal; flowers minute, racemose or spicate; column very short, with no appendages or foot; epiphytes.....................................892. **Oberonia.**

Leaves membranous or coriaceous or chartaceous, not equitant or if, very rarely (*Dendrobium* § *Aporum*), equitant and fleshy, the flowers axillary and the vaginal portion of the leaf nearly or quite as long as the main portion and with the column prolonged below into a foot:—

Terrestrial herbs; leaves membranous, rarely (*Liparis* sometimes) coriaceous, usually sessile; inflorescence terminal; flowers rather small, in racemes or spikes; column prolonged below as a foot:—

Lip with basal auricles; column very short with broad arms ....893. **Microstylis.**

Lip without basal auricles; column long, with callosities or wings or both; rostellum sometimes double

894. **Liparis.**

Epiphytic, occasionally casually epigæal but never truly terrestrial herbs; leaves chartaceous or coriaceous; column more or less prolonged below as a foot:—

¶Stems solitary or cœspitose or composed of discrete pseudo-bulbs basally attached to a short or long rhizome:—[p. 132]

Flowers from the stems or pseudo-bulbs terminal or axillary, solitary or on few-flowered peduncles or in few- or many-flowered racemes, usually large and showy; stems cœspitose with leaves chartaceous or coriaceous more than 2, rarely a creeping rhizome with distant pseudo-bulbs and 1–2 apical leaves; pollinia subequal, free ....895. **Dendrobium.**

Flowers from lateral scapes at base of pseudo-bulbs or from rhizome between them, solitary or in heads, umbels or racemes; leaves solitary coriaceous, or binary chartaceous, usually from apices of pseudo-bulbs on a prolonged rhizome; occasionally the rhizome, less often the pseudo-bulbs inconspicuous or absent; pollinia free or occasionally attached by their bases to a small spherical mass of translucent tissue, the inner pair always smaller than the outer:—

Lateral sepals longer than the dorsal; flowers (in our species) umbellate..................896. **Cirrhopetalum.**

Lateral and dorsal sepals subequal:—

Flowers (in our species) racemose; lateral sepals under lip...........................897. **Bulbophyllum.**

Flowers solitary; sepals spreading......898. **Trias.**

¶ Stems jointed, composed of elongated pseudo-bulbs strung on a woody core; leaves solitary or binary, chartaceous:—[p. 131] ....899. **Pholidota.**

§Pollinia 8:—[p. 131]

Epiphytic herbs, pseudo-bulbous or not; leaves chartaceous or coriaceous or fleshy; inflorescence lateral or terminal, racemose or capitate; column short or long, prolonged below as a foot; pollinia subequal, all cohering or cohering by fours to a common membrane ....900. **Eria.**

Terrestrial herbs, pseudo-bulbous or not; leaves membranous or chartaceous, plicate; inflorescence axillary or scapose:—

Leaves linear from a long slender pseudo-stem; lip sessile on the base of the footless column, saccate but not spurred; flowers before leaves ....901. **Pachystoma.**

Leaves elliptic, oblong or lanceolate from a short stout pseudo-stem; flowers contemporaneous with leaves:—

Sepals and petals free; lip adnate to base of long footless column, spurred ....902. **Phajus.**

Sepals connate with long foot of short column in a saccate mentum; lip mobile ...903. **Acanthephippium.**

‡Pollinia attached singly or in pairs or by fours through one or, rarely, two caudicles to a stigmatic gland :—[p. 131]

**Anther terminal :—[p. 134]

Pollinia 8, attached by fours to a granular caudicle; terrestrial herbs; leaves chartaceous, plicate ....904. **Calanthe.**

Pollinia 2 :—

Terrestrial herbs, with pseudo-bulbous stems; flowers in peduncled racemes; leaves chartaceous or membranous, plicate :—

Lip distinctly 3-lobed, saccate or spurred at base; inflorescence strict ....905. **Eulophia.**

Lip obscurely 3-lobed, wide ventricose at base but not spurred; inflorescence at first decurved...906. **Geodorum.**

Epiphytic herbs :—

Stem pseudo-bulbous; leaf solitary......907. **Thecostele.**

Stem not pseudo-bulbous; leaves several :—

Stems very short, leaves closely clustered, flat, fleshy and pendulous; lip spurred, with forked appendages on its disk ....908. **Doritis.**

Stems more or less elongated; leaves coriaceous and flat or fleshy and terete :—

Lip not spurred; leaves terete............909. **Luisia.**

Lip spurred, adnate to the column or to its foot :—

Column prolonged into a long foot which forms an elongated spur with no callus or septum within :—

Lip jointed to the foot ......910. **Ornitharium.**

Lip not jointed to the foot ....911. **Ærides.**

Column with little or no foot :—

○Spur with neither calli nor septum within :—[p. 134]

Spur compressed, very deep, pubescent at the mouth; side-lobes none 912. **Rhynchostylis.**

Spur not compressed, long narrowly cylindric, or wide funnel-shaped or short saccate, rarely (one *Vanda*) reduced to a gibbous swelling and then the leaves flat :—

Side-lobes of lip usually large; spur wide infundibuliform, glabrous at the mouth; if side-lobes of lip small then the spur also subobsolete; flowers large; caudicle of pollinia very broad...............913. **Vanda.**

Side-lobes of lip small or none; mouth naked or fimbricate; spur narrow cylindric or short wide saccate; flowers small; caudicle of pollinia very narrow ...914. **Saccolabium.**

⊙Spur within partially or completely occluded by calli :—[p. 133]

Spur occluded by a dorsal scale or by calli on the anterior and posterior walls but without a septu ....915. **Cleisostoma.**

Spur within partially occluded by calli and divided by a vertical antero-posterior septum into two lateral chambers...916. **Sarcanthus.**

**Anther dorsal; pollinia 4 in 2 pairs with two very long caudicles tapering to a minute gland; epiphytic herbs [p. 133]
917. **Camarotis.**

†Pollen powdery, granular or in small masses :—[p. 131]

Anther terminal; pollinia 2 or 4 cohering by their sides without either gland or caudicle :—

Large leafy epiphytic climbers with coriaceous leaves
918. **Vanilla.**

Small erect terrestrial herbs :—

Saprophytic leafless herbs with sepals and petals united into a 5-toothed 2-labiate tube ....919. **Didymoplexis.**

Green herbs with sepals and petals free; leaf solitary after the flower from a separate tuber, rarely from the same tuber and contemporaneous................................920. **Pogonia.**

Anther posticous, vertical but inverted; pollinia 2, or 4 in 2 pairs, attached occasionally directly but usually by one or by two caudicles to a solitary gland; terrestrial herbs :—

Stigma single, anticous; pollinia 2, or 4 in 2 pairs :—

Pollinia narrow-clavate, 2, produced and united below to a single caudicle inserted on a long, narrow gland; leaves plicate, chartaceous or subcoriaceous :—

Lip spurred or saccate, but with no claw...921. **Tropidia.**

Lip with a long claw, but neither spurred or saccate
922. **Corymbis.**

Pollinia short clavate, inserted directly on the gland; leaves flat, membranous :—

Pollinia 2, lip saccate at the base, the sac usually setose or tubercled within; gland variously shaped...923. **Goodyera.**

Pollinia 4, lip neither saccate nor spurred; gland always narrow..924. **Spiranthes.**

Stigmas 2, lateral, distant; pollinia 2, each 2-partite; lip sessile; leaves flat, membranous :—

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Base of lip produced as a long spur ......925. **Vrydagzynea.**

Base of lip saccate but not spurred ....926. **Zeuxine.**

*Anthers 2, each with only one perfect cell, cells sessile on the column remote or contiguous but always discrete, the outer cell empty ; pollinia 2, sometimes 2-partite, attached with or without caudicles to two separate glands ; leaves flat, membranous ; terrestrial herbs [p. 131] 927. **Habenaria.**

Class XXI. MONŒCIA.

Minute annual lenticular or granular floating aquatic herblets with little or no proper vascular organisation ; flowers without perianth :—

Flowers from chinks in the margin of the flattened frond ; fronds emitting roots ; anthers 2-locular, stamens 1 or 2.........1013. **Lemna.**

Flowers on the upper surface of the granular frond ; rootless ; anthers 1-celled, stamen solitary ....1014. **Wolffia.**

Conspicuous or large plants with well-developed fibro-vascular system :—

*Inflorescence a spadix subtended by a spathe :—[p. 137]

†Perianth regular 2-seriate ; flowers on a usually branched spadix ; leaves tufted at the apex of a usually elongated woody stem ; trees or shrubs (palms) ; leaves pinnately divided :—[p. 136]

Leaves twice pinnatisect, the segments very obliquely dimidiate-flabelliform ; spadix interfoliar but followed progressively downwards by alternately male and female infrafoliar spadices ; stamens many, free.......................................986. **Caryota.**

Leaves completely or partially once pinnatisect :—

‡Spadix interfoliar, flowering while the leaf in the axil of which it is produced is still green ; leaves completely pinnatisect, the segments with reduplicate sides :—[p. 136]

Leaf-segments oblong irregularly toothed ; base cuneate 1-costate ; nerves flabellate ; fruit small ; stamens 6, free 987. **Wallichia.**

Leaf-segments linear, nerves parallel, fruit large :—

Dwarf palms with prostrate branching buried stock ; spadix with male flowers on lateral catkin-like branches, female in a globose terminal head ; fruit a spherical mass of hexagonal 1-celled and 1-seeded ripe carpels ; stamens monadelphous 988. **Nipa.**

Tall palms with erect unbranched stem ; spadix with scattered female flowers alone or between two males near the bases and with close-set males towards the tips of the branches ; fruit a large ovoid, terete or sub-3-gonous nut with a fibrous husk ; stamens 6, free.... ....989. **Cocos.**

‡Spadix infrafoliar, flowering after the fall of the leaf in the axil of which it is formed; leaf-segments towards apex of leaf more or less confluent as a plaited lamina :—[p. 135]

Male flowers one on each side of a female along the branches of the spadix ; stamens nearly free ....991. **Pinanga.**

Male flowers minute solitary or 2-nate towards tips of spadix branches ; female flowers larger solitary ; stamens 3 or 6, free 992. **Areca.**

†Perianth absent ; spadix unbranched with males above and females below on different portions ; herbs :—[p. 135]

Water or marsh plants ; leaves entire ; barren appendage 0 ; ovules orthotropous :—

Floating stemless aquatic herbs ; leaves sessile obovate-cuneate in a rosette-like tuft ; base stoloniferous ; stamens monadelphous 997. **Pistia.**

Submerged aquatic or palustrine herbs ; leaves tufted from a buried creeping rootstock ; stamens 1 or 2, free 998. **Cryptocoryne.**

Terrestrial herbs :—

§Leaves and scapes rising directly from a tuber-like hypogæal corm, the leaves usually more or less lobed, sect, or partite ; if leaves entire (*Typhonium* sometimes) not peltate ; connective narrower than anther-cells :—[p. 137]

Spadix with a barren terminal appendage :—

Flowers and leaves present together ; leaves undivided or more or less 3-lobed or pedatipartite ; males and females remote ; neuters present above the females and sometimes below the males ; ovules orthotropous ; stamens 1 or 2–3, free ....1000. **Typhonium.**

Flowers appearing before the leaves :—

Males and females remote ; neuters present above the females ; leaves pedatipartite ; edges of the spathe connate below ; ovules orthotropous ; stamens solitary 1001. **Sauromatum.**

Males and females contiguous or nearly so ; neuters 0 ; leaves 3-sect, segments pinnatifid ; edges of spathe free ; ovules anatropous ; stamens 2–4, free 1002. **Amorphophallus.**

Spadix without a barren appendage ; males and females separated by a belt of pisiform pearly-white neuters ; flowers appearing before the leaves ; leaves 3-sect, segments pinnatifid ; edges of spathe free ; ovules anatropous ; stamens 2–4, free ....1003. **Plesmonium.**

§Leaves and scapes arising from a short caudex prolonging a hypogæal rhizome or if arising direct from a tuber-like hypogæal corm the leaves peltate and undivided; connective wider than the anther-cells; flowers and leaves present together:—[p. 136]

Leaves peltate; stamens monadelphous:—

Spadix with a barren appendage; not adnate at its base to the spathe:—

Ovules few, basal ....1004. **Alocasia.**

Ovules many, parietal ....1005. **Colocasia.**

Spadix without an appendage; ovules many parietal:—

Spadix quite free from the spathe ......1006. **Remusatia.**

Spadix at base and female part of inflorescence partially adnate to the spathe ....1007. **Steudnera.**

Leaves not peltate; spadix without a barren appendage; stamens 2–4, free ....1008. **Aglaonema.**

*Inflorescence rarely subtended by a spathe; if with a spathe then not spicate:—[p. 135]

¶Leaves with venation parallel; nearly all aquatic or marsh plants:—[p. 140]

Ovary inferior, carpels connate; perianth 2-seriate, 3 outer segments calycine, 3 inner petaloid; stamens 6 or 9, free; floating aquatics with conspicuous flowers..................889. **Hydrocharis.**

Ovary superior:—

Carpels 2 or more, free:—

Tufted aquatics with large radical leaves; flowers whorled on erect scapes, conspicuous; perianth 2-seriate with 3 segments in each series; carpels many; seeds basilar erect; stamens 9 or more, free ....1017. **Sagittaria.**

Creeping submerged aquatics with linear usually opposite leaves; flowers minute, axillary; perianth 0; carpels 2–9, usually only 4 ripening; seeds pendulous; stamen solitary 1022. **Zanichellia.**

Carpel solitary or, if 2 or more, carpels connate; flowers minute:—

Flowers axillary; creeping submerged aquatics with linear opposite, alternate or whorled leaves; perianth of male flower double, outer whorl tubular, 4-fid, inner hyaline; of female single hyaline or 0; carpel solitary; stamen solitary 1023. **Najas.**

Flowers in terminal spikes or spikelets or heads; leaves radical tufted or distichous or 3-stichous along the stem;

erect or floating aquatics or occasionally non-aquatic, never wholly submerged and creeping :—

Stamens many ; filaments free or connate ; flowers aggregated in terminal cylindric spadices without a subtending spathe ; perianth reduced to setæ ; tall gregarious marsh plants with tufted linear spongy leaves ....996. **Typha.**

Stamens few, never more than 6, often fewer :—

Flowers arranged in heads at the apices of slender scapes, longer than the leaves ; flowers 3-merous or 2-merous ; perianth segments 6 or 4, rarely fewer ; stamens 6 or 4 rarely 3, 2, or 1 ; ovary 3- or 2-lobed, and 3- or 2-celled ; tufted rarely floating aquatics............1024. **Eriocaulon.**

Flowers arranged in spikelets in the axils of glumaceous bracts ; leaves sheathing at the base ; ovary 1-celled :—

Flowers in axil of a glume ; leaves 3-stichous, sheaths closed in front, ligule 0 ; fruit a minute nut with embryo inside albumen ; style simple, stigmas 2–3 :—

Ovary and fruit enclosed in a bottle-shaped utricle with an entire or notched or shortly slit mouth ; stamens 2 or 3, free ....1025. **Carex.**

Ovary and fruit not enclosed in a utricle :—

Spikelets with a terminal female flower and with 2 basal opposite male flowering glumes ; stamen 1 :—

Spikes laxly corymbose ; style 2-fid ; nut rounded or obtusely angled ....1026. **Hypolytrum.**

Spikes in a dense oblong panicle ; style 3-branched ; nut 6-ribbed...1027. **Scirpodendron.**

Spikelets with the terminal flower not female ; the female flowers basal :—

Glumes entire with one small median vein ; stamens 1, or 2–3, free ....1028. **Scleria.**

Glumes 3-fid, with 5–7 strong veins ; stamens 1 or 2, free ....1029. **Diplacrum.**

Flowers interposed between a glume and a palea ; leaves distichous, sheaths open in front, ligulate at apex behind ; fruit a grain with embryo outside albumen ; styles 2, free or sometimes connate below :—

Spikelets in continuous spikes, racemes or panicles ; glumes herbaceous or membranous, the lower smaller, sometimes very small or suppressed ; lower flowering glume generally resembling the outer glumes in structure and nervation, the upper firmer, at length

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rigid, often papery to crustaceous, awnless or, rarely, mucronate ; stamens 3:—

- Branches of the panicle produced beyond the uppermost spikelets ; glume I minute, hyaline ; spikelets narrow ....1049. **Chamæraphis.**
- Branches of the panicle not produced beyond the uppermost spikelets ; glume I distinct ; spikelets subglobose..................................1051. **Isachne.**

Spikelets in pairs, one sessile the other pedicelled, or the terminal ternate or solitary on the axis of a usually spike-like raceme ; outer glumes more or less rigid and firmer than the flowering glumes, the lower always longer than the florets ; flowering glumes membranous ; often hyaline, that of the upper floret often awned or reduced to an awn :—

- Spikelets of each pair differing in sex and structure :—
  - Spikelets 3, a sessile 2-flowered and 2 pedicelled enclosed in a peduncled spathe on a short 1-nodal inarticulate rachis ; stamens 3 ...1074. **Apluda.**
  - Spikelets many or few on a plurinodal articulate rachis :—
    - Lower floret of the sessile spikelet male :—
      - Margin of glume I of sessile spikelet inflexed ; stamens 3 ....1075. **Ischæmum.**
      - Margin of glume I of sessile spikelet not inflexed ; stamens 1–2...1079. **Lophopogon.**
    - Lower floret of all the spikelets empty : stamens 3 ....1082. **Anthistiria.**

Spikelets forming a spicate inflorescence, male and female spikelets on different spikes or, if on the same spike, with the females at the base of the spike ; stamens 3 :—

- Fruiting spikelets densely crowded on a cylindric spongy rachis, the grain exposed ......1084. **Zea.**
- Fruiting spikelets lax, rachis slender, grain concealed :—
  - Fruiting spikelet with glume I transformed into a crustaceous polished nut-like envelope to the other glumes and the grain...1085. **Polytoca.**
  - Fruiting spikelet enclosed in the stony, polished, nut-like bract...............1086. **Coix.**

¶ Leaves with venation reticulate; all except *Myrophyllum* and *Ceratophyllum* terrestrial :—[p. 137]

Aquatic plants with submerged or floating stems; leaves whorled :—

Ovary inferior, 4- or 2-celled; stamens 4...318. **Myriophyllum.**

Ovary superior; 1-celled; stamens 20–30...880. **Ceratophyllum.**

Terrestrial plants :—

†Climbers provided with tendrils :—[p. 141]

‡Ovary inferior or only half-superior and if half-superior with 1-celled anthers :—[p. 141]

**Anthers 2-celled; ovules horizontal or very rarely pendulous; female flowers usually solitary never panicled; leaves never divided into distinct leaflets :—[p. 141]

††Anthers folded together or sigmoidly curved :—[p. 141]

§§Corolla rotate or, if campanulate, divided almost or quite to the base into 5 free petals :—[p. 141]

Petals fimbriate at their margins; anthers connate, stamens 3 ....361. **Trichosanthes.**

Petals with entire margins :—

Calyx-tube of male flowers elongated; stamens inserted within and included in the calyx-tube; anthers cohering in an oblong head, stamens 3 :—

Tendrils simple; stigmatic lobes of female flower linear simple; petiole without glands 362. **Gymnopetalum.**

Tendrils divided; stigmatic lobes of female flower 2-lobed; petiole with 2 glands at its apex 363. **Lagenaria.**

Calyx-tube of male flower short :—

Stamens inserted at mouth of calyx; filaments exserted, recurved; anthers free :—

Fruit dry, endocarp fibrous, opening by a stopple; male flowers partly in racemes; stamens 3–5 ....364. **Luffa.**

Fruit soft, endocarp fleshy, indehiscent; male and female flowers alike solitary; stamens 3 ....365. **Benincasa.**

Stamens inserted below the mouth of the calyx; filaments hardly exserted, not recurved; anthers more or less coherent :—

Calyx with 2–3 scales at its base; male

flowers with usually a large enveloping bract; tendrils simple; stamens 2–3 366. **Momordica.**

Calyx without scales at its base; male flowers with no enveloping bract; stamens 3:—

Connective produced beyond anther-cells; tendrils simple ....367. **Cucumis.**

Connective not produced; tendrils 2-3-fid 368. **Citrullus.**

§§Corolla campanulate, not divided much more than half-way down: tendrils 2–3-cleft; stamens 3, anthers connate [p. 140] ....370. **Cucurbita.**

††Anther-cells straight, or if curved (*Bryonia*) not conduplicate nor sigmoid; stamens 3; anthers free:—[p. 140]

Male and female pedicels alike 1-flowered, clustered:—

Tendrils simple ....372. **Mukia.**

Tendrils 2-fid ....373. **Bryonia.**

Male flowers in corymbs or racemes ...374. **Melothria.**

Anthers 1-celled, cells straight; stamens free 3–5, flowers small, the females in panicles or many-flowered racemes; ovary half-superior [p. 140] ....376. **Actinostemma.

‡Ovary superior; anthers 2-celled; fruit capsular [p. 140] 358. **Modecca.**

†Erect herbs, shrubs, or trees, or if climbing not provided with tendrils:—[p. 140]

§Leaves compound:—[p. 142]

¶Erect tall trees; leaves not pellucid gland-dotted:—[p. 142]

¶¶Leaves odd-pinnate:—[p. 142]

Flowers in male catkins and female spikes; perianth incomplete or absent; leaflets with resinous glands on underside; fruit a small globose nut adnate to the accrescent, 3-lobed scarious reticulate bracts; stamens 4–12; ovary 1-ovuled ....875. **Engelhardtia.**

Flowers paniculate; perianth complete of a 4–5-lobed calyx and 4 or 5 petals; stamens 8 or 10; leaves not glandular beneath:—

Leaflets opposite except the terminal; petals 4–5 imbricate; ovary 1-celled; fruit a small drupe 209. **Odina.**

Leaflets all alternate; petals 5 induplicate-valvate; ovary 2–5-partite; fruit of 1–5 samaras 148. **Ailanthus.**

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¶¶Leaves digitate [p. 141] ....105. **Sterculia.**

¶Prickly climbing or sarmentose shrubs; leaves 3-foliolate, casually 1-foliolate; leaflets pellucid gland-dotted; stamens 2–5 [p. 141]..134. **Toddalia.**

§Leaves simple:—[p. 141]

Ovary inferior; flowers, at least the female, without a complete perianth:—

Leaves alternate:—

Trees; calyx 4–5-partite; stamens 4–7, attached at base of calyx with as many alternate clavate glands; ovary 1-celled, ovule 1, pendulous; fruit a nut crowned by the accrescent spathulate calyx-lobes
330. **Gyrocarpus.**

Herbs:—

Stamens many, free or connate; ovary 2–4-celled; ovules very many on axial placentas; perianth 1-seriate or sub-2-seriate, segments 4 or 5; fruit capsular or succulent; stem and leaves succulent
378. **Begonia.**

Stamens 5, filaments connate; ovary 1-celled, ovule 1 erect; corolla tubular 5-toothed, in female flower 0; fruit dry indehiscent; stem and leaves coarse
465. **Xanthium.**

Leaves opposite or sometimes (*Viscum*) reduced to scales:—

Stamens 3–4, opposite and adnate to the perianth-lobes; tree-parasites (mistletoe) ....809. **Viscum.**

Stamen 1; marsh-weeds ....318*. **Callitriche.**

Ovary superior, sometimes unclosed and with ovules naked:—

*Ovary present as a closed cavity:—[p. 151]

†Ovary 4–more-locular; flowers not in catkins:—[p. 143]

‡Petals 0, or if present, free:—[p. 143]

Ovary 5-locular; perianth 1-seriate; petals 0; stamens connate in a column with anthers near its apex; leaves alternate:—

Ovary with cells 2- or more-ovuled:—

Fruit of 2-valved cocci ......817. **Glochidion.**

Fruit of ripe carpels opening like follicles
105. **Sterculia.**

Ovary with cells 1-ovuled; carpels in fruit indehiscent, subsamaroid.........106. **Heritiera.**

Ovary 4–5-locular; perianth 2-seriate; petals 4–5

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stamens connate in one or in 4–5 phalanges, ovary with cells 1-ovuled; fruit indehiscent; leaves opposite ....80. **Garcinia.**

‡Petals connate in a salver-shaped corolla; leaves alternate [p. 142] ....604. **Cordia.**

†Ovary not more than 2–3-locular, or if (*Quercus* rarely) 4–5-locular the male flowers in catkins :—[p. 142]

Male inflorescence in catkins; fruit of 1–more nuts enclosed in an involucre of confluent bracts; stamens 6–12; cells of ovary 2-ovuled :—

Involucre of bracts not armed; nut solitary, rarely quite enveloped..........................877. **Quercus.**

Involucre of bracts armed with spines; nuts often 2 or more, usually quite enveloped

878. **Castanopsis.**

Male inflorescence not in catkins :—

¶Ovary 2–3-, rarely more-loculed; ovules 2 or 1 in each loculus :—[p. 149]

Flowers aggregate-monœcious, many males (consisting of each a solitary pedicelled stamen) surrounding a single central 3-carpelled pedicelled female, all enclosed in a pseudo-calycine involucre; perianth proper 0, or rarely of 1–3 minute scales at the joint between pedicel and flower; cells of ovary 1-ovuled; herbs, shrubs, or trees with milky acrid juice :—

Involucre regular, campanulate or turbinate or slightly irregular; glands free and alternate with segments of involucre...811. **Euphorbia.**

Involucre oblique, irregular, slipper-shaped, declinate, produced into a spur glandular within..........................812. **Pedilanthus.**

Flowers separate-monœcious; perianth of sepals almost always present, occasionally also a corolla; stamens 1–2-seriate or all in the centre of the flower :—

§Stamens of the outer or only series opposite the sepals, or if stamens all in the centre of the flower then the cells of the 2–many-carpelled ovary each 2-ovuled; petals when present small or minute; sepals 1–2-seriate, inflorescence always lateral or axillary :—[p. 145]

Flowers in small axillary cymes; sepals 5, imbricate; petals 5, each 2-fid; stamens 5, free; ovary 2-3-celled, fruit an indehiscent drupe; shrubs or small trees
168. **Chailletia.**

Flowers not cymose:—

‡Male flowers in axillary fascicles, or solitary axillary:—[p. 145]

Corolla of 5, rarely 6, scale-like petals:—

Calyx-lobes or segments 5, valvate; stamens 5, filaments connate in a column; trees or shrubs:—

Ovary 2-celled; fruit indehiscent
814. **Bridelia.**

Ovary 3-celled; fruit dehiscent
815. **Cleistanthus.**

Calyx of 5-6 imbricate sepals; stamens 3-6, free or only slightly connate at the base; ovary 3-celled, fruit dehiscent ......816. **Actephila.**

Corolla absent in both sexes; sepals imbricate:—

Styles in the female confluent in a long or short column or cone faintly toothed at the apex; calyx 4-6-lobed or toothed; disk 0 in either sex; anthers 3-8 connate in an ellipsoid or oblong sessile column with linear cells; trees or shrubs
817. **Glochidion.**

Styles separate, or if partly connate the style-arms and stigmas free; stamens usually connate (free in *Phyllanthus* § *Cicca*):—

††Disk 0 in either sex, or if present (*Agyneia*) then only in male flowers; stamens 3, filaments united in a column:—[p. 145]

‡‡Fruit a capsule with 3 2-valved carpels; anthers sessile at apex of column; disk present in males; herbs [p. 145] ...819. **Agyneia.**

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‡‡Fruit of 3–6 indehiscent cocci; disk 0 in either sex:—[p. 144]

Anthers sessile on angles of column; calyx of male 6-lobed, spreading, of female 6-cleft, persistent; small shrubs or undershrubs
820. **Sauropus.**

Anthers adnate to whole length of column; calyx of male turbinate or hemispheric, lobes much inflexed; of female short, 6-lobed; shrubs or small trees ...821. **Breynia.**

††Disk present in both sexes, or if absent (*Phyllanthus* § *Emblica*) then only absent from male flowers; stamens united, partly united or free; fruit dehiscent, or separating into cocci, or indehiscent; herbs, shrubs, or trees [p. 144]
822. **Phyllanthus.**

‡Male flowers in axillary racemes; stamens 4–8, free round a rudimentary pistillode, filaments short, anthers didymous; fruit a fleshy irregularly rupturing capsule; trees [p. 144]
827. **Baccaurea.**

§Stamens of the outer or only series alternate with the sepals or if the stamens all central the cells of the 2–3-, rarely 4-celled, ovary each 1-ovuled; petals if present often exceeding the sepals; inflorescence axillary or terminal:—[p. 143]

¶Flowers in terminal spikes racemes or panicles almost always androgynous; petals present at least in the male flowers, or if absent from both sexes (*Manihot*) then with a large hypogynous disk in both male and female flowers with stamens definite, 2-seriate, marginal:—[p. 146]

Flowers in 2–3-chotomously cymose

panicles; stamens erect; leaves digitately lobed:—

Calyx imbricate in bud, regularly 5-lobed; fruit dry, capsular, each carpel 2-valved:—

Stamens 10, united in 2 series round the lobes of a hypogynous disk; petals none in either sex; shrubs or trees ....828. **Manihot.**

Stamens many, the outer 5 in a series opposite the petals, the rest in a column in centre of flower; petals 5; shrubs or small trees 829. **Jatropha.**

Calyx irregularly valvate, rupturing into 2–3-lobes; fruit a drupe; stamens 8–20, the outer 5 in a series opposite petals, the rest free in the centre of the flower; trees ....830. **Aleurites.**

Flowers in androgynous spikes or racemes; stamens inflexed in bud with anthers reversed, many, inserted on the hairy receptacle; fruit dry, capsular, each carpel 2-valved; leaves penninerved or 3–more-nerved from base; trees or shrubs 831. **Croton.**

¶ Flowers in axillary clusters, spikes, racemes or panicles or if terminal then with petals absent at least from male flower and usually from both with (*Mallotus* sometimes, *Ricinus*) the stamens indefinite central, or (*Excœcaria* sometimes, *Sapium*, *Sebastiana*) with stamens definite 1-seriate:—[p. 145]

§Petals present in male flower; filaments straight; ovary 3-celled; fruit capsular:—[p. 147]

Sepals imbricate; disk developed in both sexes; stamens 15–30, free shrubs or trees; flowers usually in 1-sexual racemes, rarely a female at base of male raceme; males small,

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fascicled ; females solitary
832. **Codiæum.**

Sepals valvate ; disk in male obscure ; stamens 5–15, connate below ; diffuse herbs ; male flowers crowded in upper part of raceme, females solitary pedicelled ....833. **Chrozophora.**

§Petals none in either sex :—[p. 146]

Sepals imbricate, 4–6, free ; flowers in clusters or numerous axillary racemes or panicles ; small erect herbs ; stamens 10–30, central filaments free or a few connate; anther-cells adnate throughout to a broad connective ; capsule dry, crustaceous ....836. **Baliospermum.**

Sepals or calyx-segments valvate or occasionally calyx obsolete ; flowers in axillary, rarely terminal, spikes racemes or panicles :—

*Calyx of male flowers closed in bud, usually membranous, oblong, ovoid or globose, splitting valvately to the base into 3–5 concave sepals ; female flower sometimes with sepals imbricate :—[p. 149]

†Styles distinct, usually long, entire, 2-fid, multifid or papillose-fimbriate ; erect herbs or trees, or erect rarely climbing shrubs ; fruit capsular, rarely drupaceous :—[p. 148]

‡Filaments free :—[p. 148]

**Anther-cells united only by their 2 bases ; stamens many or few ; herbs or shrubs :—[p. 148]

Styles undivided, spreading, fringed, short ; disk of 3 hypogynous scales ; stamens 3, or 5–10...838. **Claoxylon.**

Styles filiform, long, laciniate or fimbriate ; male flowers small ebracteate, females at base of male

spikes or in separate spikes usually with a large bract; disk 0; stamens 8 to many
839. **Acalypha.**

**Anther-cells globose, laterally attached to the connective; stamens many; trees or shrubs :—[p. 147]

Anther-cells 2; flowers all minute in axillary or terminal simple or panicled spikes or racemes; fruit capsular; disk sometimes present in female flower
841. **Mallotus.**

Anthers 3-4-locellate; disk 0; style long 2-fid; trees or shrubs; male flowers in long axillary racemes, female flowers 1–2 on a long axillary peduncle; fruit capsular
842. **Cleidion.**

‡Filaments connate in bundles, branched; disk 0; flowers in terminal subpaniculate racemes, upper male crowded, lower female; tree-like annual herbs with palmate serrate-lobed leaves; fruit a capsule [p. 147]
845. **Ricinus.**

†Styles connate; twining herbs with axillary androgynous racemes; stamens 1-seriate; disk 0 or obscure; fruit a capsule :—[p. 147]

Styles connate below, spreading above; male calyx 3–5-partite; stamens 1–3; seeds with a firm coat ....846. **Tragia.**

Styles united below in a fleshy column incurved above; male calyx 3-partite; stamens 3; seeds with a fleshy coat
847. **Cnesmone.**

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*Calyx of male flower open in bud; styles entire, free or shortly connate at the base; stamens 1-seriate; disk 0; trees, shrubs, or erect herbs:—[p. 147]

Trees or shrubs; stamens 3, rarely 2; filaments free:—

Calyx 2–3-lobed; flowers in terminal simple or panicled spikes or racemes; males several, females solitary in each bract; females in lower part of spike or on separate spikes; fruit fleshy or pulpy, rarely woody 848. **Sapium.**

Calyx deeply 3-partite; flowers in lateral axillary or terminal spiciform 1-sexual or androgynous racemes or spikes; males 1–3 in each bract, 2-bracteolate; females at base of raceme or in separate racemes; fruit crustaceous 849. **Excœcaria.**

Herbs; stamens 2–4, filaments connate at the base; male calyx minute; flowers in slender terminal axillary or lateral racemes; males minute 1–3 in each bract, females solitary at base of raceme or lower and long-pedicelled on the stem; fruit crustaceous 850. **Sebastiania.**

¶Ovary 1-locular; ovule solitary:—[p. 143]

§§Leaves without stipules; alternate:—[p. 150]

Anthers oblong or linear-oblong: perianth-segments 5, rarely fewer, free, membranous, dry, present in both male and female flowers; bracteate and 2-bracteolate...770. **Amarantus.**

Anthers didymous; perianth of male herbaceous 3–5 partite, without bract or bracteoles; of female 0 ....782. **Atriplex.**

§§Leaves stipulate :—[p. 149]

- Stamens 6 ; stipules ochreate 788. **Rumex.**
- Stamens 5 or fewer ; stipules never ochreate :—
  - ††Plants with watery juice :—[p. 151]
    - Anthers in bud erect ; style 2-fid ; ovule pendulous ; male sepals induplicate-valvate ; stipules lateral ....854. **Trema.**
    - Anthers in bud reversed, stamens inflexed ; style undivided or 0 ; ovule erect, orthotropous :—
      - Leaves and stems beset with stinging hairs ; herbs with alternate leaves and connate stipules :—
        - Ovary oblique ; style obliquely ovoid or linear, hooked, with sometimes 2 basal arms ....856. **Fleurya.**
        - Ovary straight ; stigma subulate papillose ....857. **Girardinia.**
      - Leaves and stems with no stinging hairs :—
        - Female perianth 3-5-partite or obsolete ; stigma penicillate ; flowers in cymes or clustered on a fleshy receptacle :—
          - Leaves opposite ; flowers cymose or capitellate ....858. **Pilea.**
          - Leaves alternate ; flowers on a fleshy receptacle ; female perianth very small or none 859. **Elatostema.**
        - Female perianth tubular, shortly toothed or subentire, enclosing the achene :—
          - Fruiting perianth dry, membranous ; stigma filiform :—
            - Shrubs ; stigma persistent 860. **Bœhmeria.**
            - Herbs ; stigma jointed, deciduous 861. **Pouzolzia.**
          - Fruiting perianth more or less fleshy, in fruit adnate to the

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ovary; stigma penicillate
864. **Debregeasia.**

††Plants with milky juice:—[p. 150]

Anthers in bud reversed, stamens inflexed; ovule pendulous, anatropous; shrubs or trees; style 2-fid or 2-partite:—

Female sepals fleshy in fruit and enclosing the achenes; both male and female spicate or male spicate and female subcapitate ....866. **Morus.**

Female sepals not fleshy; male flowers subcapitate; female few or solitary
869. **Streblus.**

Anthers in bud erect; style undivided or 2-fid; ovule pendulous, anatropous or somewhat amphitropous:—

Flowers all exposed:—

Inflorescence elongated; male flowers in cylindric spikes, female in racemes; small trees ...871. **Balanostreblus.**

Inflorescence contracted in globose or oblong heads; erect trees
873. **Artocarpus.**

Flowers on the inner walls of a closed receptacle; trees or erect or climbing shrubs.........................874. **Ficus.**

*Ovary an unclosed carpellary leaf with ovules naked; stamens monadelphous:—[p. 142]

Leaves conspicuous, coriaceous:—

Leaves opposite; large climbers; flowers whorled on interrupted spikes; males with a membranous 2-lobed, females with an utricular perianth ....881. **Gnetum.**

Leaves (in our species) alternate; trees; male flowers in sessile clustered spikes; female flowers solitary; perianth 0
882. **Podocarpus.**

Leaves small, scale-like, 4-fariously adpressed, imbricate; trees, male flowers terminal solitary, female in small ovoid or oblong cones; perianth 0
883. **Thuya.**

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Flowers arranged on spadices subtended by a spathe or by several spathaceous bracts :—

Perianth 2-seriate, 3-merous ; spathes simple :—

Trees with erect stems and terminal tufts of leaves ; fruit smooth ; unarmed palms :—

Leaves flabelliform, orbicular or nearly so............985. **Borassus.**

Leaves pinnatisect, segments with induplicate sides...990. **Phœnix.**

Climbing shrubs with voluble stems and scattered leaves ; fruit lepidote with reflexed, shining, closely imbricate adpressed scales ; prickly palms :—

Spathes tubular, persisting ....993. **Calamus.**

Spathes cymbiform or open, deciduous ....994. **Dæmonorops.**

Perianth 0 :—

Trees or shrubs ; leaves long, narrow, coriaceous, spinescent on margins and keel ; spadices involved in several spathaceous bracts ; fruit a globose or oblong mass of angular drupes ...995. **Pandanus.**

Herbs ; leaves digitately or pedately 3–more-sect, unarmed ; spathe simple ; fruit a cylindric mass of small spherical few-seeded berries 999. **Arisæma.**

Flowers not on spadices subtended by a spathe ; if spicate, without a basal involving bract, or if provided with an involving basal bract then not on spikes :—

*Leaves with venation strictly parallel ; with narrow blades and distinct basal sheaths :—[p. 153]

Ovary inferior ; aquatic species with flowers enclosed in spathes but never spicate :—

Stems branching, leafy ; spathes small, sessile ; perianth double :—

Leaves whorled ; ovules anatropous..................885. **Hydrilla.**

Leaves scattered ; ovules orthotropous ......886. **Lagarosiphon.**

Stems 0, or with stolons only ; leaves tufted, radical, sessile : spathes on long scapes :—

Perianth single ....887. **Vallisneria.**

Perianth double...888. **Blyxa.**

Ovary superior ; perianth single or irregular or 0 :—

Submerged creeping aquatic plants with minute axillary flowers 1023. **Najas.**

Erect species ; leaves with a long stem-clasping leaf-sheath ; flowers arranged in spikelets in the axils of glumes :—

†Leaves 3-stichous ; sheaths closed in front, not ligulate ; herbs, glumes without paleæ [p. 153]..........................1025. **Carex.**

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†Leaves 2-stichous; sheaths open in front, ligulate behind; shrubs, glumes paleate [p. 152] ....1046. **Spinifex.**

*Leaves with netted reticulation, even when the main-nerves parallel the intermediate venation anastomosing :—[p. 152]

‡Plants climbing with the aid of tendrils :—[p. 154]

§Ovary inferior :—[p. 154]

Anthers 2-celled; female flowers usually solitary; leaves entire or lobed but never divided into distinct leaflets :—

Anther-cells folded together or sigmoidly curved :—

Corolla rotate, or if campanulate divided almost or quite to the base into 5 free petals :—

Petals fimbriate at their margins :—

Ovules 12; perfect seeds usually 6, each with an abortive seed attached to its side............360. **Hodgsonia.**

Ovules and perfect seeds very numerous 361. **Trichosanthes.**

Petals with entire margins :—

Calyx-tube of male flower elongated :—

Tendrils simple; stigmatic lobes of female flower linear, simple; petiole without glands 362. **Gymnopetalum.**

Tendrils divided; stigmatic lobes of female flower 2-lobed; petiole with two glands at its apex 363. **Lagenaria.**

Calyx-tube of male flower short, with 2–3 scales at its base; the male flowers with usually an enveloping bract; tendrils simple ....366. **Momordica.**

Corolla campanulate, not divided much more than half-way down ....369. **Cephalandra.**

Anther-cells straight :—

Flowers large, deep yellow; male racemes short 371. **Thladiantha.**

Flowers small, pale yellow; male pedicels or racemes slender :—

Connective produced; fruits on capillary pedicels; male flowers usually racemed ....374. **Melothria.**

Connective not produced; fruits on short pedicels; male flowers usually corymbose or subumbellate 375. **Zehneria.**

Anthers 1-celled, cells straight; flowers small, the female ones many, racemed or panicled; leaves pedately divided into 3–5 leaflets ....377. **Gynostemma.**

§Ovary superior :—[p. 153]

Leaves twice 3-nate ; perianth of 4 sepals and 4 petals ; stamens 8 ; fruit an inflated capsule..................190. **Cardiospermum.**

Leaves simple, 3–5-nerved and reticulate between the nerves ; perianth 2-seriate, each series 3-merous ; stamens 6 ; fruit a globose berry ....961. **Smilax.**

‡Plants with erect stems or, if climbing, not provided with tendrils :—[p. 153]

Ovary inferior :—

Ovary 3-celled ; ovules in each cell 2, superposed ; climbing, rarely erect, herbs or shrubs ; perianth segments 6, 2-seriate ; stamens 3 or 6 ; leaves simple or compound ...958. **Dioscorea.**

Ovary 1-celled ; ovule solitary ; erect species with 5-merous, rarely 4-merous, perianth :—

Leaves alternate :—

Herbs with prickly leaves, flowers in heads surrounded by an involucre of bracts ; anthers syngenesious 491. **Cnicus.**

Trees with unarmed simple leaves ; flowers not in heads anthers free :—

Petals imbricate ; style 1 ; drupe ultimately superior 205. **Drimycarpus.**

Petals valvate ; styles 3 ; drupe half-inferior or inferior 206. **Holigarna.**

Leaves opposite, flat and thick, or reduced to scales on a jointed stem ; semiparasitic herbs (mistletoe) ...809. **Viscum.**

Ovary superior :—

Anther-cells opening by upcurved at length deciduous valvular lids ; leaves simple, gland-dotted ; aromatic erect trees or shrubs ; perianth-segments 2-seriate, all calycine

Flowers clustered, enclosed in densely imbricating bracts ; perianth-segments 6 ....800. **Actinodaphne.**

Flowers umbellate, the umbels involucrate ; perianth-segments sometimes 6, sometimes 4, sometimes small or obsolete 801. **Litsæa.**

Anther-cells dehiscing by chinks or pores, never by valves :—

*Perianth double, of calyx and corolla :—[p. 157]

¶Leaves compound ; trees or shrubs :—[p. 155]

Stamens united in a tube ....158. **Amoora.**

Stamens not united in a tube :—

Ovary 1-celled ; stamens 8–10 ....209. **Odina.**

Ovary 2–3-celled ; stamens 8 :—

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Leaves pinnate........................193. **Erioglossum.**

Leaves 3-foliolate........................191. **Allophylus.**

¶ Leaves simple :—[p. 154]

Stamens fewer than petals ; stamens 2, petals 4, valvate, sometimes petals 0 in female flower ; leaves opposite 535. **Olea.**

Stamens at least as many as the petals or lobes of corolla, sometimes more numerous than petals :—

Stamens alternate with petals and not exceeding them in number :—

Leaves opposite ; stamens and petals 4...539. **Azima.**

Leaves alternate ; stamens and petals usually 5 :—

Leaves conspicuous :—

Stamens connate in centre of flower ; petals smaller than sepals..................814. **Bridelia.**

Stamens not connate :—

Petals valvate ; climbers ; ovary 1-celled :—

Flowers capitate ; style simple ; flowers without staminodes............174. **Miquelia.**

Flowers racemose ; styles 2 ; male flowers with 5 staminodes opposite the petals, outside the stamens.........175. **Natsiatum.**

Petals imbricate ; erect shrubs or trees :—

Ovary 4-more-celled ; style simple ; petals connate below ....176. **Ilex.**

Ovary 1-celled ; styles 3 ; petals free 207. **Semecarpus.**

Leaves very small, scale-like, stem-clasping ; sepals and petals imbricate ; styles 3 73. **Tamarix.**

Stamens more numerous than petals, or if not exceeding them in number then opposite the petals or corolla-lobes :—

†Carpels 3 or more, free, rarely solitary ; perianth usually 3-merous :—[p. 156]

‡Petals valvate :—[p. 156]

Perianth 3-merous ; sepals 3, valvate ; petals 6, 2-seriate ; stamens many ; carpels many ; small trees ....13. **Miliusa.**

Perianth not 3-merous ; sepals connate in a 5-toothed calyx ; corolla 3–5-lobed ; stamens 3–5, opposite the corolla-lobes ; ovary 1-celled with 2 pendulous ovules; climbers 173. **Iodes.**

‡Petals imbricate; climbers:—[p. 155]

Stamens free; perianth-segments free; carpels 3 or more:—

Petals 2; sepals 8; anthers 4...31. **Antitaxis.**

Petals 6:—

Sepals 9–12; anthers 6, opening obliquely 30. **Hæmatocarpus.**

Sepals 6:—

Anthers 9 ....26. **Pycnarrhena.**

Anthers 6:—

Carpels in male flowers 0:—

Stamens with thickened apices, anthers dehiscing obliquely; carpels 3; styles forked ......27. **Tinospora.**

Stamens with subglobose anthers, dehiscing transversely; carpels 3–6; styles cylindric ....28. **Cocculus.**

Carpels in male flower 3, rudimentary; stamens subcylindric; anthers dehiscing vertically; carpels 9–12; styles subulate 29. **Tiliacora.**

Stamens connate:—

Anthers 6; perianth-segments all free:—

Carpels 3, accompanied by staminodes:—

Petals 6, sepals 6; female staminodes 6 22. **Parabæna.**

Petals 0, sepals 6; female staminodes 9 23. **Anamirta.**

Carpel solitary, female staminodes 0; sepals 6–10 in male, 3–5 in female; petals always 3–5 ....24. **Stephania.**

Anthers 4; male petals 4 connate, sepals 4; female petal 1, sepal 1 ......25. **Cissampelos.**

†Carpels 3 or more, connate in a syncarpous ovary; trees or erect shrubs; perianth rarely 3-merous:—[p. 155]

¶Ovary 3–5-celled; styles free:—[p. 157]

Petals 0, imbricate, only slightly united below 81. **Eurya.**

Petals contorted, connate in a 3-more-lobed gamophyllous corolla:—

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Flowers 3-merous ....527. **Maba.**

Flowers 4–5-merous ....528. **Diospyros.**

¶Ovary 1-celled, with 4–5 parietal placentas:—[p. 156]

Stamens many, hypogynous; petals free:—

Sepals free, imbricate......59. **Taraktogenos.**

Sepals connate, subvalvate 60. **Chaulmoogra.**

Stamens 10, adnate to the gamopetalous corolla, 5 with filaments alternate with lobes, 5 opposite lobes without filaments ....359. **Carica.**

*Perianth of one whorl (calyx) only, or absent:—[p. 154]

Stamen in male flower solitary; trees or shrubs:—

Tall trees with green leafless jointed branchlets with small scales whorled at the joints; perianth-segments 1–2, minute; ovary 1-celled, 2-ovuled ...876. **Casuarina.**

Shrubs or small trees with large pinnatisect leaves clustered at apex of an unbranched stem; perianth 0; ovaries (carpophylls) with naked ovules ......884. **Cycas.**

Stamens in male flower 2 or more than 2:—

§Stamens monadelphous:—[p. 158]

Perianth absent; females in few-flowered cones; males spicate, fascicled or solitary; leaves alternate or opposite; ovules naked; trees...............882. **Podocarpus.**

Perianth present:—

Leaves opposite; flowers whorled on simple or branching spikes; ovules naked; climbers ...881. **Gnetum.**

Leaves alternate; ovules enclosed in the cells of a 1–more-celled ovary; trees or shrubs:—

Ovary 1-celled, 1-ovuled:—

Seeds with a mace; stamens connate in a central column; trees.......................793. **Myristica.**

Seeds without a mace; stamens connate below in a ring or tube; shrubs armed, climbing, or trees ....765. **Pisonia.**

Ovary 3-, sometimes more-celled:—

‡Small trees; flowers in axillary clusters:—[p. 158]

Fruit smooth; ovary often more than 3-celled, styles columnar; ovules 1 in each cell 817. **Glochidion.**

Fruit tubercled or echinate; ovary 3-celled styles distinct; ovules 1 in each cell 835. **Chætocarpus.**

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‡Shrubs: flowers in axillary spikes; ovary 3-celled, ovules 1 in each cell [p. 157]
844. **Homonoia.**

§Stamens free:—[p. 157]
†Ovary 2- or more-celled:—[p. 159]
Leaves compound:—
Leaves even-pinnate ....195. **Schleichera.**
Leaves 3-foliolate ....813. **Bischofia.**
Leaves simple:—
Sepals imbricate—
Cells of the ovary each 1-ovuled; stamens many
834. **Gelonium.**
Cells of the ovary each 2-ovuled:—
Stamens many; sepals ciliate; ovary 2–5-celled; fruit a berry ....57. **Flacourtia.**
Stamens definite, or if many (*Cyclostemon* sometimes) the sepals not ciliate:—
Fruit a loculicidal capsule
198. **Dodonæa.**
Fruit indehiscent or tardily dehiscent:—
Male flowers in axillary spikes, racemes, or panicles:—
Seeds not arillate ....826. **Aporosa.**
Seeds arillate ....827. **Baccaurea.**
Male flowers in axillary fascicles or solitary:—
Fruit a drupe; trees:—
Stamens 2–4; drupe 1-celled
823. **Putranjiva.**
Stamens 8 or more; drupe 2–3-celled
824. **Cyclostemon.**
Fruit a berry with 6 cocci enclosed in an indehiscent epicarp
818. **Flueggea.**
Sepals valvate, at least in the male, or open in bud; ovules 1 in each cell of ovary:—
Calyx of male unequally 4-toothed, of female 5-toothed closed in bud; flowers small, in long simple spikes or racemes, all axillary; anthers 4-celled ....837. **Endospermum.**
Calyx of male partite to the base, closed in bud, or if shortly 3-partite open in bud:—

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Calyx of male closed in bud, splitting valvately to the base into 3–5 concave sepals :—

Anthers 2-celled :—

Anther-cells oblong ; males in long, lax, lateral racemes ; females solitary on a long peduncle, or racemose ; fruit drupaceous ; leaves opposite ....840. **Trewia.**

Anther-cells globose ; both sexes with flowers in simple or branched axillary or lateral spikes or racemes ; fruit a capsule : leaves alternate or opposite 841. **Mallotus.**

Anthers 3–4-celled, the cells globose ; fruit capsular :—

Styles very long, 2-fid ; male flowers in long axillary racemes ; females 1–2 on a long axillary peduncle......842. **Cleidion.**

Styles entire, short or long ; flowers in axillary racemes or branched panicles ; males clustered ; females solitary or few 843. **Macaranga.**

Calyx of male flower open in bud, rather deeply 3-partite ; flowers in lateral axillary, or in terminal spikes ; fruit crustaceous 849. **Excœcaria.**

†Ovary 1-celled :—[p. 158]

Placentas 2–4, parietal :—

Perianth 0 ; stamens 2 or more ; placentas 2–4, many-ovuled ....879. **Salix.**

Perianth 1-seriate, distinct :—

Stamens many ; placentas 2–4, few-ovuled 58. **Xylosma.**

Stamens 4 ; placentas 4, many-ovuled 379. **Tetrameles.**

Placenta solitary :—

Ovary 2-ovuled ; stamens 2 ......825. **Antidesma.**

Ovary 1-ovuled ; stamens 5 or fewer :—

*Leaves without stipules :—[p. 160]

Female flowers ebracteate ; perianth subglobose, 3-4-toothed ....781. **Spinacia.**

Female flowers 2-bracteate ; perianth 0 782. **Atriplex.**

*Leaves with stipules :—[p. 159]
Perianth 0 ....791. **Piper.**
Perianth calycine, 1-seriate, regular or irregular :—
Plants with watery juice :—
Anthers in bud erect ; style 2-fid ; ovule pendulous :—
Trees with penninerved leaves ; ovule anatropous ; male sepals induplicate-valvate ....854. **Trema.**
Herbs or annual undershrubs with digitate leaves ; ovule obcampylotropous ; male sepals imbricate...855. **Cannabis.**
Anthers in bud reversed ; stamens inflexed ; style undivided or 0 ; ovule erect, orthotropous :—
Female perianth 3–5-partite, or obsolete ; stigma penicillate ; flowers in cymes, or clustered on a fleshy receptacle :—
Leaves opposite ; flowers cymose or capitellate ....858. **Pilea.**
Leaves alternate ; flowers on a fleshy receptacle ; female perianth very small or 0 ....859. **Elatostema.**
Female perianth tubular, shortly toothed or subentire, enclosing the achene :—
Fruiting perianth dry, membranous ; stigma filiform......860. **Bœhmeria.**
Fruiting perianth more or less fleshy :—
Ovary free ; stigma penicillate ; leaves narrow 862. **Sarcochlamys.**
Ovary adnate ; leaves broad :—
Stigma sessile, subpeltate, ciliate 863. **Villebrunea.**
Stigma penicillate 864. **Debregeasia.**
Plants with milky juice :—
†Anthers in bud reversed ; stamens inflexed ; ovule pendulous, anatropous shrubs or trees :—[p. 161]

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Style undivided, elongated; male flowers spicate, female in globose heads; achenes stipitate 865. **Broussonetia.**

Style 2-fid or 2-partite :—

Female sepals fleshy in fruit and enclosing the achenes; flowers numerous, both male and female spicate, or male spicate and female subcapitate ....866. **Morus.**

Female sepals not fleshy; female flowers few or solitary :—

Male flowers racemose, bracts minute; female sepals very short 867. **Taxotrophis.**

Male flowers subcapitate :—

Bracts of male flowers many, large; female sepals foliaceous 868. **Phyllochlamys.**

Bracts of male flowers 2; female sepals coriaceous, clasping the ovary ....869. **Streblus.**

†Anthers in bud erect; style undivided or 2-fid; climbing shrubs :—[p. 160]

Ovule erect, orthotropous; stipules connate, intrapetiolar 870. **Conocephalus.**

Ovule pendulous, anatropous; stipules lateral, small ....872. **Cudrania.**

Class XXIII. POLYGAMIA.

[Plants having polygamous flowers, which therefore belong to this class, have been distributed among the other classes according to the nature of their hermaphrodite flowers.]

Class XXIV. CRYPTOGAMIA.

*Aquatic, more or less submerged, or floating herbs :—[p. 162]

†Plants growing at sides or in depths of pools or sluggish streams :—[p. 162]

Fronds pinnatisect, dimorphic; sori on veins running longitudinally down the fertile pinnæ nearly parallel to both midrib and edge 1134. **Ceratopteris.**

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Fronds long petioled, with 4 terminal obcordate to cuneate segments; sori in closed conceptacles ....1155. **Marsilea.**

†Plants floating on the surface of ponds and rice-field swamps:—[p. 161]

Fronds entire, with complicated anastomosing venation 1153. **Salvinia.**

Fronds small, deeply lobed, each lobe 1-nerved only...1154. **Azolla.**

*Terrestrial or epiphytic herbs:—[p. 161]

Leaves very small in proportion to the stem, or absent:—

Stem articulate, simple or with whorled branches; leaves reduced to rings of teeth at the nodes; sori on underside of peltate bracts making a terminal cone-like fructification; erect in bud 1156. **Equisetum.**

Stem not articulate, simple or dichotomously branched; leaves not whorled; circinate in bud; sori in axils of bracts or leaves, either scattered along stems or aggregated in terminal cone-like fructifications:—

Sporangia of 2 sorts, one with large spores, one with more numerous small spores; leaves usually 4-stichous and 2-morphic, rarely uniform ....1159. **Selaginella.**

Sporangia all of one sort with many small spores; leaves almost always uniform and usually multifarious:—

Leaves many, crowded; sporangia orbicular, compressed, 1-celled, 2-valved ....1157. **Lycopodium.**

Leaves few, distant, rudimentary; sporangia turbinate, 3-celled, 3-valved ....1158. **Psilotum.**

Leaves (fronds) very large in proportion to the stem or rootstock; stem never articulate:—

Fronds erect in bud, divided more or less deeply into a fertile and a barren portion:—

Sterile portion of frond simple or, rarely, palmately lobed 1151. **Ophioglossum.**

Sterile portion of frond digitate ....1152. **Helminthostachys.**

Fronds circinate in bud:—

Sporangia opening by a lateral slit or an apical pore but without any ring; sori dorsal or marginal:—

Sporangia sessile, contiguous but discrete, arranged in bands near the edge of the pinnæ; fronds 2-pinnate, veins free 1149. **Angiopteris.**

Sporangia concrete in raised circular dorsal masses with hollow centre; fronds palmate, veins anastomosing...1150. **Kaulfussia.**

Sporangia provided with a more or less elastic ring:—

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Ring of sporangia opercular, complete, the sporangia opening down the side; sori lateral:—

Tufted ferns with simple or forked fronds 1147. **Schizæa.**

Climbing ferns with palmate, pinnatifid or pinnate fronds 1148. **Lygodium.**

Ring of sporangia equatorial:—

Ring of sporangia broad, complete, transverse; sporangia opening vertically; sori with few sporangia, dorsal, indusium 0; climbing ferns with dichotomously branching fronds 1125. **Gleichenia.**

Ring of sporangia more or less complete, jointed, vertical; sporangia usually bursting transversely; sori with many sporangia, dorsal or marginal:—

Trees; sori without an indusium............1126. **Alsophila.**

Herbs:—

†Sori furnished with an indusium:—[p. 164]

Fronds delicately membranous, transparent; indusium apical on a vein, tubular............1127. **Trichomanes.**

Fronds herbaceous or coriaceous, opaque:—

‡Sori marginal or submarginal:—[p. 164]

Indusium opening apically towards edge of frond:—

Sori discrete: indusium apical or subapical on a vein ....1128. **Davallia.**

Sori in a continuous or subcontinuous marginal or submarginal line; indusium double, the inner valve membranous ......1129. **Lindsaya.**

Indusium opening inwardly towards midrib of frond:—

Sporangia on the underside of the indusium, which consists of the intucked margin of the frond..............................1130. **Adiantum.**

Sporangia not on the underside of the indusium; the veins supporting the sori or their receptacles passing from midrib to margin:—

Sori terminal or nearly so, on distinct veins, globose and, at least at first, discrete 1131. **Cheilanthes.**

Sori on a slender filiform receptacle in the axis of the indusium, connecting several to many veins, linear and continuous:—

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Segments of fronds very small and narrow; the receptacle connecting the apices of few veins ....1132. **Onychium.**

Segments of fronds conspicuous; the receptacle connecting the apices of many veins 1133. **Pteris.**

‡Sori remote from margin of frond:—[p. 163]

Indusium linear or oblong:—

Fronds simple or variously once or oftener pinnate:—

Indusium membranous, parallel and close to and opening towards midrib 1135. **Blechnum.**

Indusium divergent from midrib, single and opening towards midrib, or double and opening both towards midrib and margin of leaf 1136. **Asplenium.**

Fronds palmately flabellate 1137. **Actinopteris.**

Indusium reniform:—

Pinnæ mostly divided, not articulate nor white-dotted above ....1138. **Nephrodium.**

Pinnæ always simple, articulate at base, with white cretaceous dots above...1139. **Nephrolopis.**

†Sori without an indusium:—[p. 163]

Sori on back of lobes confined to the veins:—

Sori round or very slightly oblong 1140. **Polypodium.**

Sori linear:—

Veins not all soriferous:—

Sori distributed generally on soriferous veins:—

Sori on the main-veins only 1141. **Gymnogramme.**

Sori on the transverse connecting veinlets only ....1142. **Meniscium.**

Sori circumscribed to a marginal or submarginal line parallel to midrib and margin of fronds:—

Fronds all similar, grassy......1143. **Vittaria.**

Fronds dimorphic ......1144. **Drymoglossum.**

Veins freely anastomosing, all soriferous 1145. **Hemionitis.**

Sori not confined to the veins, but spread over the whole under-surface of the frond...1146. **Acrostichum.**

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III. SUMMARY OF THE NATURAL SYSTEM.

SYNOPSIS OF THE CHIEF SUBDIVISIONS.

Plants bearing flowers with stamens or pistils or both; pistils bearing ovules that may ultimately change into embryonate seeds **PHANEROGAMIA.**

Pistils with a stigma; ovules contained in an ovary composed of a carpel with cohering edges or of two or more cohering carpels; perianth usually present...................... **ANGIOSPERMEÆ.**

First leaves of embryo solitary or alternate; framework of leaves of parallel-longitudinal or, less often, parallel-divergent, rarely netted veins; perianth usually 3-merous; woody substance of stem in isolated bundles .... **MONOCOTYLEDONES** VI.

First leaves of embryo two and opposite; framework of leaves usually of netted veins; perianth usually 4-merous or, more often, 5-merous; woody substance of stem usually in rings of bundles round a central pith....................... **DICOTYLEDONES.**

Corolla usually and calyx almost always present; flowers generally hermaphrodite:—

Segments of corolla almost always and of calyx very often coherent, corolla rarely absent; stamens almost always definite, usually adherent to corolla, sometimes hypogynous, rarely epigynous; ovary inferior, or if superior the carpels not more than 3 **COROLLIFLORÆ** III.

Segments of corolla almost always free, frequently some or all of them absent; stamens often indefinite:—

Stamens epigynous or perigynous arising from calyx or from a disk lining its tube, if epipetalous (CRASSULACEÆ sometimes) the ovary superior and carpels more than 3; segments of calyx usually united ....**CALYCIFLORÆ** II.

Stamens hypogynous arising apart from calyx direct from the receptacle or from a disk that crowns the pedicel; segments of calyx usually free..........**THALAMIFLORÆ** I.

Corolla almost always and calyx often absent; flowers generally 1-sexual ....**INCOMPLETÆ** IV.

Pistils without a stigma; ovules borne on an ovary composed of an open carpel; perianth almost always absent; first leaves of embryo two and opposite or more than two and whorled; woody substance of stem in rings of bundles round a central pith..**GYMNOSPERMEÆ** V.

Plants without flowers, bearing antheridia or archegonia or both on minute prothalli in one stage of existence and bearing small sporangia containing minute spores in an alternating stage....**PTERIDOPHYTA.**

Leaves small in proportion to the stem, the fertile ones almost always confined to a particular region :—

Leaves in whorls, the fertile ones peltate, forming a spike at the apex of the stem bearing sporangia on their inner faces **EQUISETINEÆ** IX.

Leaves not in whorls, the fertile ones flat, with sporangia in their axils ....**LYCOPODINEÆ** X.

Leaves large in proportion to the stem, the fertile ones not confined to a particular region :—

Leaves bearing sporangia on their upper surfaces **RHIZOCARPEÆ** VIII.

Leaves bearing sporangia on their lower surfaces ..**FILICES** VII.

PHANEROGAMIA.—Exceptions mainly teratological; certain flowers may accidentally (*Brassica*, *Sterculia*, *Triumfetta*, &c.) have pistil, less often stamens, or constantly ("Green Rose" of gardens) both these whorls replaced by leafy organs; garden "double"-flowers may have no proper stamens, these being replaced by petals; certain fruits (*Musa*, &c.) may have no pips owing to ovules not developing into seeds.

ANGIOSPERMEÆ.—Carpels open and young seeds naked from an early stage in some species (*Sterculia colorata*, &c.), but stigma present, and carpels closed prior to fertilization. Partial or complete absence of perianth is noted under the various subdivisions.

MONOCOTYLEDONES.—Parallel-divergent veins in many SCITAMINEÆ and most PALMEÆ; the character is, however, associated with 3-mery of perianth-segments. Netted-venation characterises most AROIDEÆ, but is associated with specialized inflorescence (spadix and spathe) not met with in Dicotyledons. Netted veins also occur in the leaves of *Tacca*, *Dioscorea*, and *Smilax*; the diagnostic marks for each are noted under the 3-merous Dicotyledons. Perianth more or less incomplete in PANDANACEÆ, TYPHACEÆ, NAIADACEÆ, LEMNACEÆ, ERIOCAULEÆ, CYPERACEÆ, GRAMINEÆ, most AROIDEÆ, some HYDROCHARIDEÆ.

DICOTYLEDONES.—Parallel-divergent veins in leaves of some GUTTIFERÆ, MYRTACEÆ, and URTICACEÆ, but without 3-mery of perianth. The 3-merous Dicotyledons are met with in MENISPERMACEÆ, ANONACEÆ, MAGNOLIACEÆ, BERBERIDEÆ, PAPAVERACEÆ (*Argemone*), all distinguished from *Tacca*, *Dioscorea*, and *Smilax* by having 9 or more perianth-segments in place of 6, or if (ANONACEÆ sometimes) there are only 6 by having carpels free; also in some EUPHORBIACEÆ, distinguished by having only 3 perianth-lobes in place of 6; finally in MELIACEÆ (*Amoora*), MELASTOMACEÆ (*Sonerila*), and EBENACEÆ (*Maba*). *Amoora* differs from *Tacca* and *Smilax* in having compound leaves, and from the species of *Dioscorea* with compound leaves in having the leaves pinnate not digitate. *Sonerila* differs from *Smilax* and *Dioscorea* in having 2-sexual flowers, from *Tacca* in having a 3-locular ovary. *Maba* differs from *Tacca* in having 1-sexual flowers, from *Dioscorea* in having the ovary superior, from *Smilax* in having the corolla unlike the calyx and gamophyllous.

COROLLIFLORÆ.—Corolla may be absent in OLEACEÆ (*Olea*); petals may be free in OLEACEÆ (*Olea*), SALVADORACEÆ (*Azima*), STYRACEÆ; stamens are indefinite in STYRACEÆ and sometimes in EBENACEÆ.

CALYCIFLORÆ.—Calyx-tube very short or sepals free in some LEGUMINOSÆ, ROSACEÆ, SAMYDACEÆ, FICOIDEÆ. Petals absent in some LEGUMINOSÆ, ROSACEÆ, COMBRETACEÆ, LYTHRACEÆ, DATISCEÆ, SAMYDACEÆ, FICOIDEÆ.

THALAMIFLORÆ.—Thalamus like a calyx-tube in most NYMPHÆACEÆ, calyx-tube distinct in *Portulaca*. Petals more or less united at base in TERNSTRŒMIACEÆ, TAMARISCINEÆ, OLACINEÆ, ILICINEÆ, &c.; absent at times in RANUNCULACEÆ, BIXINEÆ, STERCULIACEÆ, SAPINDACEÆ, OLACINEÆ, RHAMNACEÆ, CRUCIFERÆ, CARYOPHYLLACEÆ, &c.

INCOMPLETÆ.—Petals occasionally present in EUPHORBIACEÆ; perianth similarly 2-seriate in some LAURINEÆ; calyx and corolla distinct in *Loranthus*.

GYMNOSPERMEÆ.—Imperfect perianth occurs in flowers of *Gnetum*.

PTERIDOPHYTA.—In *Equisetum*, *Lycopodium*, and some species of *Selaginella*, the fertile organs are aggregated in a conical mass simulating an inflorescence. In certain FILICES also (*Ophioglossum*, *Helminthostachys*, *Acrostichum*, &c.), the limitation of sporangia to definite fronds gives rise to a similar appearance.

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SYNOPSIS OF THE NATURAL ORDERS.

I. THALAMIFLORÆ.

*Sepals usually imbricated in bud; if valvate (RANUNCULACEÆ: *Clematis*, *Naravelia*) then with sepals free, leaves opposite, stamens many, and fruitlets separate; or (SAPINDACEÆ: *Nephelium*) with leaves compound, even-pinnate, and seeds arillate:—[p. 171]

†Sepals usually free; if united below then (SAPINDACEÆ: *Schleichera*, *Nephelium*) with compound alternate even-pinnate leaves, or (SAPINDACEÆ: *Turpinia*) with compound opposite odd-pinnate ones, or (CARYOPHYLLACEÆ: *Saponaria*) with simple opposite leaves:—[p. 170]

‡Stamens indefinite (more than 12); if definite (CAPPARIDEÆ: one *Cleome* 6, one *Capparis* 8) then with 4 sepals, 4 petals, and a 2-valved capsule without a replum, or else a berried fruit on a long gynophore; or (PORTULACACEÆ: *Portulaca* partly) with 2 sepals and a central placenta; or (TERNSTRŒMIACEÆ: *Eurya* sometimes) attached to base of petals:—[p. 168]

Sepals 3 or fewer; deciduous:—

Petals more or less resembling sepals, in 2-many more or less distinctly ternate whorls; carpels many in several whorls; trees or shrubs with alternate leaves ......III. **Magnoliaceæ.**

Petals coloured, unlike green sepals; herbs:—

Sepals 2 with petals 4, or 3 with petals 6; ovary 1-celled with nerviform or intruded parietal placentas; leaves alternate; sap milky ....VIII. **Papaveraceæ.**

Sepals 2 with petals 4 or 5; ovary 1-celled with free central placentas; leaves alternate or opposite; sap watery; stamens definite (8–12) in some *Portulacas* ....XVI. **Portulacaceæ.**

Sepals 4 or more; if 2–3 (GUTTIFERÆ: *Ochrocarpus*) then trees with opposite or 3-nate leathery leaves and resinous juice:—

Petals many in several whorls or in a continuous spiral with the sepals; aquatic plants with a submerged rootstock

VII. **Nymphæaceæ.**

Petals few, usually 4 or 5, rarely 8–12, or 10, in one rarely in two whorls; if many (RANUNCULACEÆ: *Naravelia*) then like staminodes in terrestrial climbers with opposite cirrhiferous leaves; if in a continuous spiral with sepals and bracts (TERNSTRŒMIACEÆ: *Camellia*) then in terrestrial shrubs:—

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Sepals deciduous:—

Carpels when ripe usually quite free; if partially coherent (*Nigella*) the ovules arising from the ventral sutures of the closed carpels ....I. **Ranunculaceæ.**

Carpels coherent in a 1-locular ovary with parietal or (BIXINEÆ sometimes) intruded placentæ:—

Fruit either a 2-valved sessile or stipitate capsule without a replum and with marginal placentæ, or a berry separated from the torus by a long gynophore; floral whorls 4-merous; embryo small at the base of the albumen ....XI. **Capparideæ.**

Fruit either fleshy and sessile, or a capsule with median placentæ; embryo considerable, near middle of albumen XIII. **Bixineæ.**

Sepals persistent:—

Leaves alternate; trees or shrubs:—

Stamens quite free from the petals;

Pistil of 1-many carpels distinct or cohering in the axis of the flowers; styles quite free throughout, terminal or subdorsal; disk 0; carpels more than 1-ovuled II. **Dilleniaceæ.**

Pistil deeply lobed, lobes oblique, embedded in an accrescent disk; styles connate central; loculi 1-ovuled XXXII. **Ochnaceæ.**

Stamens attached to the bases of and deciduous with the petals ....XXI. **Ternstrœmiaceæ.**

Leaves opposite:—

Flowers almost always 1-sexual or polygamous, 4-merous; if 5-merous with resinous juice; leaves coriaceous not gland-dotted ....XX. **Guttiferæ.**

Flowers hermaphrodite, 5-merous; leaves herbaceous gland-dotted ....XIX. **Hypericineæ.**

‡Stamens definite, 10 or fewer:—[p. 167]

Flowers usually 3-merous, if 2-merous (some MENISPERMACEÆ) then 1-sexual; carpels free or solitary; stamens 6 free equal opposite the petals; leaves alternate:—

Flowers minute 1-sexual; scandent herbs or shrubs; seeds usually reniform; carpels 3 ....V. **Menispermaceæ.**

Flowers (in our species) hermaphrodite; erect shrubs; anthers dehiscing by 2 valves; carpel solitary ......VI. **Berberideæ.**

Flowers 4–5-merous (sepals in FUMARIACEÆ only 2):—

Petals 4 with stamens 6; placentas 2 parietal, fruit a capsule with 2 valves or a small indehiscent nutlet; herbs with alternate leaves; sepals deciduous:—

Sepals 4; stamens free in 2 rows, an inner with 4 longer and an outer with 2 shorter filaments; petals similar, their limbs cruciformly set; fruit with a partition (replum) stretched from placenta to placenta ....X. **Cruciferæ.**

Sepals 2; stamens united in two bundles of 3 each; petals irregular in 2 dissimilar pairs; fruit without a replum IX. **Fumariaceæ.**

Petals usually 5, sometimes 4, with perfect stamens as many or twice as many as petals and sepals (anisomerous in all POLYGALACEÆ and some SAPINDACEÆ):—

Ovary 1-celled; sepals usually persistent; stamens and petals isomerous:—

Placentas 3, parietal; stamens as many as sepals; petals often irregular; leaves alternate rarely opposite XII. **Violaceæ.**

Placentas free central; stamens usually twice as many as sepals; petals regular:—

Leaves herbaceous, always opposite; sepals united below or free; petals free, sometimes 0; herbs XV. **Caryophyllaceæ.**

Leaves scale-like minute, alternate; sepals free; petals slightly connate below; shrubs ..XVII. **Tamariscineæ.**

Ovary 2- or more-celled; if 1-celled (POLYGALACEÆ: *Xanthophyllum*, *Securidaca*) the flower not isomerous:—

Seeds many attached to inner angles of cells of fruit; flowers regular 3–5-merous with carpels as many as sepals; small diffuse plants with simple opposite stipulate leaves XVIII. **Elatineæ.**

Seeds 1, less often 2 to each cell of fruit and either erect or pendulous; if more than two and attached to inner angle of cells (GERANIACEÆ: *Oxalideæ* and *Impatiens*) then either with regular flowers and alternate digitate or pinnate leaves (*Oxalis*, *Biophytum*, *Averrhoa*) or with opposite or alternate simple leaves and irregular flowers:—

**Seeds pendulous:—[p. 170]

††Flowers usually anisomerous (sepals 5, stamens 8; subisomerous in *Salomonia*) filaments connate in a sheath usually adnate to petals; sepals and petals generally irregular; ovary 1–2-locular; leaves simple alternate; disk 0 [p. 170] ......XIV. **Polygalaceæ.**

††Flowers isomerous; disk usually present:—[p. 169]

Leaves compound opposite; stamens quite free; stamens always 10 ......XXVIII. **Zygophyllaceæ.**

Leaves simple, or if compound alternate; stamens more or less united:—

Ovules in each carpel 2 collateral; cells of capsular fruit 2-chambered, chambers each 1-seeded; leaves always alternate simple; stamens always 5; petals and sepals always regular ......XXVI. **Lineæ.**

Ovules in each carpel 2 with stamens 10 and regular perianth; if more than two with regular perianth and stamens 10 and compound alternate leaves, or irregular perianth stamens 5 with connate anthers and simple leaves ..XXIX. **Geraniaceæ.**

Seeds erect; flowers isomerous or anisomerous; leaves usually alternate even-pinnate rarely simple or digitately compound, more rarely opposite and odd-pinnate; seed often arillate [p. 169] ....XLI. **Sapindaceæ.

†Sepals more or less united at the base:—[p. 167]

Stamens indefinite; petals contorted; calyx-lobes often enlarged in fruit; trees or climbing shrubs with resinous sap; leaves alternate simple not gland-dotted; calyx-lobes and petals 5 XXII. **Dipterocarpeæ.**

Stamens definite (12 or fewer); if indefinite (RUTACEÆ: *Citrus*, *Ægle*) the leaves gland-dotted:—

Leaves pellucidly gland-dotted; simple or compound, opposite or alternate; calyx-lobes and petals 4–5; stamens inserted outside the prominent disk; petals often valvate ......XXX. **Rutaceæ.**

Leaves not gland-dotted:—

Leaves opposite simple; calyx-lobes and petals 5, stamens 10; disk obscure; ovary 3-celled, cells 1-ovuled XXVII. **Malpighiaceæ.**

Leaves alternate; if opposite (CELASTRINEÆ: *Salacia*, *Hippocratea*) the disk large, or (OLACINEÆ: *Iodes*) the ovary 1-celled:—

†Carpels syncarpous septate, or apocarpous; ovules few, pendulous erect or ascending:—[p. 171]

‡‡Stamens alternate with the petals:—[p. 171]

§Ovules and seeds pendulous:—[p. 171]

¶Leaves compound:—[p. 171]

Filaments free; fruit drupaceous indehiscent; leaflets opposite ....XXXI. **Simarubeæ.**

Filaments united in a tube; if free (*Cedrela*) fruit

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capsular, or if fruit drupaceous (*Walsura*) then the leaflets alternate ....XXXIV. **Meliaceæ.**

¶Leaves simple:—[p. 170]

Petals 2-lobed, imbricate; raphe of seed ventral XXXV. **Chailletiaceæ.**

Petals entire; raphe of seed dorsal:—

Petals usually valvate, fruit 1-celled 1-seeded XXXVI. **Olacineæ.**

Petals imbricate, fruit of 3–5 1-seeded pyrenes XXXVII. **Ilicineæ.**

§Ovules and seeds erect or ascending:—[p. 170]

Ovary 3–5-locular, leaves simple XXXVIII. **Celastrineæ.**

Ovary 1-locular, leaves simple or compound, or 2–5-locular, leaves compound ....XLIII. **Anacardiaceæ.**

‡‡Stamens opposite petals; leaves simple or compound:—[p. 170]

Petals valvate; leaves usually stipulate XL. **Ampelideæ.**

Petals imbricate; leaves without stipules XLII. **Sabiaceæ.**

§§Carpels syncarpous 1-locular, placentæ 3, parietal with numerous ovules; disk large lining calyx-tube; leaves 2-pinnate [p. 170] ....XLIV. **Moringeæ.**

*Sepals valvate in bud; if imbricate or subimbricate then always with valvate petals and either (ANONACEÆ: some *Polyalthias*) with 3-merous 2-sexual flowers or (TILIACEÆ: some *Elæocarpi*) with anthers dehiscing transversely, or (BURSERACEÆ: *Bursera*) with balsaminous sap:—[p. 167]

Sepals free; flowers 3-merous, stamens free indefinite; ripe carpels free or rarely (*Anona*) conjoined ....IV. **Anonaceæ.**

Sepals united below; if free (TILIACEÆ: *Grewia*, *Triumfetta*) then flowers not 3-merous; flowers 5-merous or 4-merous:—

¶¶Stamens monadelphous:—[p. 172]

Stamens indefinite (in *Eriodendron* only 5–7) in a column round the style with only short free filaments towards apex or dividing upwards into phalanges opposite the petals; ultimate filaments with anthers 1-locular (2-locular in *Eriodendron* and in inner series of filaments in *Bombax*, then with compound digitate leaves and petals); staminal column adnate at base to contorted corolla-lobes; often an epicalyx of bracts below calyx; leaves except in *Eriodendron* and *Bombax* simple ....XXIII. **Malvaceæ.**

Stamens definite or subdefinite in a column or cup round style with mouth of tube usually with 5 sterile prolongations opposite the petals, the intervening sinuses bearing 1–5 2-locular anthers; sometimes (*Eriolæna*) in a column round style with short free filaments from middle upwards, then with anthers 2-locular; leaves simple, sometimes compound-digitate, and then with no petals ....XXIV. **Sterculiaceæ.**

¶¶Stamens free or (TILIACEÆ rarely) filaments slightly connate in a ring or shortly 3–5-adelphous at the base; anthers 2-locular:—[p. 171]

Stamens indefinite or if subdefinite (*Triumfetta*, *Corchorus*) then twice as many as petals; leaves entire or lobed always simple; trees, shrubs or herbs ....XXV. **Tiliaceæ.**

Stamens always definite:—

Stamens usually twice as many, rarely only as many as petals, if isomerous then alternate with petals and quite free; leaves compound unequally pinnate; trees with balsaminous sap XXXIII. **Burseraceæ.**

Stamens as many as and always opposite the petals which usually are hooded over the anthers and are adnate to filaments at their insertion; trees or shrubs, often climbing, rarely herbs; leaves always simple ....XXXIX. **Rhamnaceæ.**

II. CALYCIFLORÆ.

*Stems herbaceous or woody, or if fleshy (FICOIDEÆ: *Sesuvium*; BEGONIACEÆ; CRASSULACEÆ) not flattened or articulated; leaves distinct:—[p. 175]

†Ovary apocarpous with 1 or more than one carpel; or syncarpous with several completely closed loculi; if ovary syncarpous 1-celled (SAXIFRAGACEÆ: *Vahlia*) the placentas not parietal:—[p. 174]

‡Ovules arising from the inner angles or from bases of carpels or loculi, or if arising from apex of loculus (SAXIFRAGACEÆ: *Vahlia*) then with ovules very many:—[p. 174]

Carpels solitary, excentric, style terminal; flowers irregular with definite often diadelphous stamens, or regular with generally indefinite stamens; ovules many or few arising from inner angle of carpel; calyx with odd sepal nearest axis; leaves almost always stipulate ....XLVI. **Leguminosæ.**

Carpels several or if solitary either (some ROSACEÆ) with style not terminal and with odd sepal remote from axis or (some CONNARACEÆ) with ovules basilar and with exstipulate leaves:—

§Flowers hermaphrodite:—[p. 173]

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Carpels free, or if ultimately united, with styles distinct:—

Stamens indefinite; leaves stipulate; carpels many free or often ultimately united, not seldom carpel 1; ovules usually 2 from inner angle of cell; style not terminal; odd sepal remote from axis ....XLVII. **Rosaceæ.**

Stamens definite; leaves not stipulate:—

Carpels quite free; fruits follicular:—

Ovules 2 arising from base of carpels which are often fewer in number than lobes of calyx; shrubs or trees, leaves alternate................XLV. **Connaraceæ.**

Ovules very many arising from inner angles of carpels which always are as many as calyx-lobes; herbs with opposite succulent leaves and stems XLIX. **Crassulaceæ.**

Carpels with free styles but elsewhere united; fruits capsular; leaves opposite; seeds many; herbs:—

Seeds with straight embryo in centre of albumen; ovules (*Vahlia*) from placentas suspended from top of a 1-locular ovary ....XLVIII. **Saxifragaceæ.**

Seeds with curved embryo enclosing albumen; ovules from inner angle or from base of loculi LXV. **Ficoideæ.**

Carpels and styles united throughout; stipules 0:—

Calyx-lobes imbricate; trees or shrubs:—

Stamens indefinite; petals imbricate; anthers opening by slits; leaves usually opposite and gland-dotted LIV. **Myrtaceæ.**

Stamens definite; petals valvate; anthers opening usually by pores; leaves opposite not dotted, usually 3–5-nerved from base ....LV. **Melastomaceæ.**

Calyx-lobes valvate; stamens definite, rarely indefinite:—

Ovary free from calyx-tube; petals usually corrugated; aquatic herbs, or trees or shrubs; if ovary adnate to calyx-tube (*Punica*) then stamens indefinite LVI. **Lythraceæ.**

Ovary adnate or semi-adnate to calyx-tube with stamens definite; marsh or aquatic herbs....LVII. **Onagraceæ.**

§Flowers 1-sexual; ovary inferior:—[p. 172]

Flowers symmetrical; stamens definite, usually three with corrugated anthers; styles united or only free at apex; placentas confluent in axis of ovary; climbing, tendril-bearing herbs and shrubs ....LXI. **Cucurbitaceæ.**

Flowers not symmetrical; stamens numerous, free or conjoined, anthers ovoid; placentas projecting from inner angle

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into carpellary chamber; styles free or only united at base; herbs or shrubs with more or less succulent leaves and stems ....LXII. **Begoniaceæ.**

‡Ovules suspended from apices of carpels or loculi; ovaries almost always inferior, usually more than 1-locular; ovules always few:—[p. 172]

Ovules more than one in each loculus, the flowers hermaphrodite; or if ovules in each loculus solitary, the flowers 1-sexual:—

Aquatic submerged herbs with 1-sexual flowers; styles usually 4, free; ovules solitary; stamens definite; leaves whorled LI. **Halorageæ.**

Terrestrial, or if aquatic not submerged, trees and shrubs; with hermaphrodite or rarely (COMBRETACEÆ: *Gyrocarpus*) 1-sexual flowers; styles united; ovules (except *Gyrocarpus*) more than one:—

Ovary 2–6-locular; maritime species (except *Carallia*); leaves opposite ....LII. **Rhizophoreæ.**

Ovary 1-locular; land species (except *Lumnitzera*); leaves opposite or alternate ....LIII. **Combretaceæ.**

Ovules solitary in each loculus, the flowers hermaphrodite; terrestrial herbs, trees and shrubs:—

Flowers in axillary cymes or fascicles; fruit drupaceous with a 1–2-celled stone; trees or shrubs with simple opposite or alternate almost entire leaves; stipules 0 ....LXVIII. **Cornaceæ.**

Flowers in umbels; leaves almost always alternate, compound or if simple usually deeply lobed; stipulate:—

Trees or shrubs; fruit usually somewhat fleshy; carpels generally more than two, without glandular vittæ, and never separating spontaneously..............LXVII. **Araliaceæ.**

Herbs; fruit dry separating spontaneously into two dry indehiscent carpels with usually glandular vittæ containing an essential oil ....LXVI. **Umbelliferæ.**

†Ovary syncarpous 1-locular, with 3–5 parietal placentas with many ovules, usually free from calyx-tube, occasionally half-inferior (SAMYDACEÆ: *Homalium*) or inferior (DATISCEÆ); styles usually distinct (more or less united in SAMYDACEÆ: *Casearia;* and in PASSIFLOREÆ); lobes of calyx, petals and stamens definite; flowers regular:—[p. 172]

§Flowers hermaphrodite or if 1-sexual (PASSIFLOREÆ: *Carica*) with ovary superior:—[p. 175]

¶Herbs of small size, the leaves beset with glandular hairs; styles quite distinct [p. 175] ....L. **Droseraceæ.**

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¶Shrubs erect or climbing, or trees, without glandular hairs:—[p. 174]

Flowers with a distinct corona between petals and stamens; climbers with tendrils or (*Carica*) trees with 1-sexual flowers and a superior ovary; styles united at least below LX. **Passifloreæ.**

Flowers without a distinct corona between the petals and stamens:—

Sepals and petals dissimilar; styles altogether free; shrubs LIX. **Turneraceæ.**

Sepals and petals similar or nearly so; styles united at base or free; trees ....LVIII. **Samydaceæ.**

§Flowers 1-sexual or polygamous, with ovary inferior; segments of perianth minute; styles distinct often 2-partite; leaves alternate without stipules; trees [p. 174]................LXIII. **Datisceæ.**

*Stems fleshy, flat and articulate; leaves minute; flowers large hermaphrodite; calyx adnate to ovary; lobes of calyx, petals and stamens numerous; styles radiating at tips, united below; ovary syncarpous, 1-locular, with parietal placentas [p. 172] ....LXIV. **Cactaceæ.**

III. COROLLIFLORÆ.

*Ovary inferior; stamens equal in number to, rarely fewer than, and always alternate with, lobes of corolla; flowers regular or, less often, irregular; fruit never of two elongated follicles:—[p. 176]

Stamens attached to the corolla, equal in number with its lobes:—

Anthers free; ovary 2–many-locular, chambers 1–many-ovuled; seeds usually with copious albumen; calyx-limb toothed, lobed or partite; leaves opposite:—

Stipules absent or if present lateral ......LXIX. **Caprifoliaceæ.**

Stipules present, inter- or intrapetiolar, or leaflike and whorled with their leaves; flowers sometimes in heads without involucres LXX. **Rubiaceæ.**

Anthers connate, syngenesious; ovary 1-locular, 1-ovuled; seeds without albumen; calyx-limb reduced to a pappus or obsolete; flowers usually in heads surrounded by an involucre; leaves usually alternate ....LXXI. **Compositæ.**

Stamens free from the corolla; ovary 2–10-locular, chambers usually many-ovuled:—

††Stamens 5, as many as the equal or unequal corolla-lobes, the filaments free from the style; ovary with 2–5, rarely 6–10 placentæ or loculi, ovules many [p. 176] ....LXXIII. **Campanulaceæ.**

††Stamens 2, fewer than the unequal corolla-lobes, the filaments united in a column along with the style; ovary 2-locular, chambers many-ovuled [p. 175] ....LXXII. **Stylideæ.**

*Ovary superior, or if inferior then (VACCINIACEÆ; most STYRACEÆ) with stamens more numerous than corolla-lobes; if with stamens only as many as corolla-lobes and ovary inferior then either (MYRSINEÆ: *Mæsa*) with stamens opposite corolla-lobes, or if (APOCYNEÆ occasionally) stamens isomerous and alternate with corolla-lobes but ovary inferior then carpels 2 and fruit of 2 elongated follicles, if inferior with stamens less numerous than corolla-lobes (GESNERACEÆ) then corolla irregular with 1-locular many-ovuled ovary, or if ovary imperfectly 2-locular the filaments not united in a column with the style:—[p. 175]

Ovary 1-locular, with a free-central placenta; stamens (except *Plumbago*) epipetalous:—

Stamens equal in number to and opposite the lobes of the regular corolla:—

Ovary 1-ovuled; styles or style-branches 5 LXXV. **Plumbagineæ.**

Ovary 2–many-ovuled; style undivided:—

Fruit capsular; herbs ....LXXVI. **Primulaceæ.**

Fruit indehiscent; trees or shrubs ......LXXVII. **Myrsineæ.**

Stamens 2, alternate with the three anterior lobes of the irregular corolla ....XCIV. **Lentibularieæ.**

Ovary 2–many-, rarely 1-locular, placentas axial or less often parietal, never free-central:—

Stamens free from the corolla and usually more numerous than its lobes; trees or shrubs:—

Flowers hermaphrodite; ovary inferior or half-inferior; stamens twice as many as corolla-lobes; style simple; ovules in each chamber many ....LXXIV. **Vacciniaceæ.**

Flowers diœcious; ovary superior; stamens equal to and opposite or twice as many as corolla-lobes or many; styles 2–8; ovules always twice as many as styles, either two in each undivided loculus, or solitary in each compartment of subdivided loculi LXXIX. **Ebenaceæ.**

Stamens attached to the corolla:—

†Ovary 3- or more-carpelled, or if 2-carpelled (some SAPOTACEÆ), with stamens either equal to and opposite, or more numerous than the corolla-lobes; flowers hermaphrodite; style simple; trees or shrubs:—[p. 177]

Ovary superior; ovules in each chamber solitary [p. 177] LXXVIII. **Sapotaceæ.

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**Ovary inferior or half-inferior or at least partially attached to calyx-tube; ovules in each chamber 2 or more [p. 176]

LXXX. **Styraceæ.**

†Ovary 2-carpelled, or if 3–5-carpelled (POLEMONIACEÆ; some CONVOLVULACEÆ and some VERBENACEÆ) with stamens either equal to and alternate with, or fewer than the corolla-lobes:—[p. 176]

‡Corolla regular, rarely slightly oblique; stamens as many as and alternate with corolla-lobes, or if oblique or irregular and perfect stamens fewer than corolla-lobes (SOLANACEÆ: *Browallia*; GENTIANACEÆ: *Canscora*) the corolla-limb plicate or subcontorted; if stamens fewer than corolla-lobes and corolla regular (OLEACEÆ) then stamens alternate with carpels:—[p. 179]

§Leaves opposite or if alternate (APOCYNACEÆ: *Thevetia*, *Cerbera*, *Plumeria*; GENTIANACEÆ: *Limnanthemum*) then either (*Cerbera*, *Plumeria*) with carpels free and only styles united, or if carpels united then (*Thevetia*) with a ring of hairy scales in corolla throat hiding the stamens, or (*Limnanthemum*) floating aquatic plants with 1-locular ovaries:—[p. 178]

Stamens 2, alternate with the carpels; corolla-lobes 4–5 or more, imbricate or valvate; ovary 2-locular, each chamber 2-ovuled or, rarely, 1- or 4- or 8-ovuled; stipules 0

LXXXI. **Oleaceæ.**

Stamens 4 or more, alternate with corolla-lobes:—

Corolla-lobes or free petals and stamens 4, segments of corolla imbricate; ovary 1-locular, 1-ovuled or 2-locular, each chamber 2-ovuled; rudimentary stipules usually present ....LXXXII. **Salvadoraceæ.**

Corolla-lobes or free petals 5, rarely many or, if 4 (LOGANIACEÆ and GENTIANACEÆ sometimes) the chambers of the 2-locular, less frequently 1-locular ovary many-ovuled:—

¶Carpels free, only the styles united or if carpels also united (APOCYNACEÆ sometimes) the corolla with lobes contorted and twisted to the left; style more or less enlarged towards the top with its stigmatic surface below the tip; stamens and corolla-lobes always 5:—[p. 178]

§§Pollen granular; stigma annular or interrupted below the smooth non-stigmatic entire or 2-fid tip of style; fruit berry-like or drupaceous or of two free follicles; ovules sometimes few (1–6) in each chamber, usually many; stipules 0, or rarely represented by interpetiolar glands or horizontal lines [p. 178]

LXXXIII. **Apocynaceæ.**

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§§Pollen aggregated in solitary or paired masses (pollinia) in each anther-cell; apex of style flattened into a plane or beaked disk with stigmatic border bearing 5 glands (corpuscles) to which the pollinia are attached in pairs or fours; stipules always absent; fruit usually of 2 free follicles [p. 177]
LXXXIV. **Asclepiadeæ.**

¶Carpels as well as styles always united; stigma terminal; corolla-lobes imbricate or valvate or, if contorted (LOGANIACEÆ: *Fagræa*; GENTIANACEÆ: except *Canscora* and *Limnanthemum*), then twisted to the right; stamens and corolla-lobes 4–5, occasionally many:—[p. 177]

Leaves joined at bases by interpetiolar stipules or raised horizontal lines, always opposite; ovary 2-locular; corolla-lobes valvate or imbricate, or if contorted (*Fagræa*) corolla long tubular and placentas 2-fid ....LXXXV. **Loganiaceæ.**

Leaves without even rudimentary stipules; ovary 1-locular or if 2-locular (*Exacum*) with corolla short rotate and placentas simple; corolla-lobes contorted or if valvate (*Limnanthemum*) the leaves alternate
LXXXVI. **Gentianaceæ.**

§Leaves alternate or if opposite (POLEMONIACEÆ: *Phlox*) the pistil 3-merous; carpels never free; stamens never hidden by a ring of scales; if aquatic floating herbs (CONVOLVULACEÆ: one *Ipomæa*) the ovary more than 1-locular:—[p. 177]

Carpels 3, and ovary 3-locular, styles simple shortly 3-fid; corolla-lobes contorted; ovules in each loculus few attached to inner angle of loculus; capsule loculicidally dehiscent
LXXXVII. **Polemoniaceæ.**

Carpels 2 or if 3 (HYDROPHYLLACEÆ: *Hydrolea* sometimes) with corolla-lobes imbricate and ovules in each loculus numerous, or if 3–5 (certain CONVOLVULACEÆ) with corolla plicate and ovules in each loculus 1–4 erect from the base of the loculus:—

**Ovules in each carpel numerous and ovary 2-locular rarely (HYDROPHYLLACEÆ: *Hydrolea*) 3-locular; if few (some HYDROPHYLLACEÆ) then with ovary 1-locular or if (rarely) ovary 2-locular and ovules few the fruit capsular but the seeds not arising from the carpel-base:—[p. 179]

††Corolla-lobes imbricate or if (rarely) contorted the ovary 1-, not 2-locular; fruit always capsular; style 2-fid or styles 2 [p. 179] LXXXVIII. **Hydrophyllaceæ.**

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††Corolla-lobes plicate or if (rarely) imbricate the style entire [p. 178] ....XCI. **Solanaceæ.**

**Ovules in each carpel 2, less often 1, rarely 4:—[p. 178]

Corolla-lobes imbricate or contorted; ovary 2-locular loculi 2-ovuled, or spuriously 4-locular loculi 1-ovuled; fruit of 2 1–2-seeded pyrenes or 4 1-seeded indehiscent nutlets; embryo with radicle superior LXXXIX. **Boragineæ.**

Corolla-lobes plicate or rarely (*Cressa*, *Cuscuta*) imbricate and then with fruit a valvular or circumscissile capsule; ovary usually 2-, rarely 3–5-locular; fruit usually dehiscent; seeds erect; if fruit indehiscent, embryo with radicle inferior ....XC. **Convolvulaceæ.**

‡Corolla irregular, or at least somewhat oblique, its lobes overlapping; uppermost stamen if present smaller than the others, often reduced to a staminode without anther or altogether absent; if corolla regular with ovules 1–2 in each ovary and fruit indehiscent (some VERBENACEÆ) then with radicle inferior:—[p. 177]

‡‡Carpels 2- or more-ovuled, usually the ovules many, but if only 2 then the ovules superposed, or if ovules 2 collateral (ACANTHACEÆ: *Thunbergia* only) the fruit a 2-valved capsule opening elastically from the tip:—[p. 180]

Ovary 1-locular, placentas parietal, or if 2-locular by intrusion of placentas (some GESNERACEÆ) only imperfectly so; ovules many:—

Parasitic leafless herbs; seeds very small, embryo very minute ....XCIII. **Orobanchaceæ.**

Green leafy herbs or shrubs; ovary often inferior; leaves usually opposite..................XCV. **Gesneraceæ.**

Ovary 2-locular or if 1-locular then (some BIGNONIACEÆ) the seeds large and closely packed in the substance of, or (PEDALINEÆ: *Martynia*) the seeds small and protected within locelli formed by, the much accrescent parietal placentas:—

Fruit opening elastically from the apex by 2 loculicidal valves; seeds usually supported on retinaculæ; leaves usually opposite ....XCVIII. **Acanthaceæ.**

Fruit dehiscent but not opening elastically, or rarely indehiscent:—

Seeds large transverse, usually with a broad membranous marginal wing, with horizontal embryo and no albumen, radicle centrifugal; fruit capsular or indehiscent and filled with fleshy or spongy pulp; mostly trees with opposite compound leaves XCVI. **Bignoniaceæ.**

Seeds small or minute; herbs or shrubs with mostly simple leaves:—

Ovary 1-locular with ovules attached singly or 1-seriately under the laminæ of a projecting parietal 2-laminate placenta or 2-locular each loculus subdivided with ovules attached singly or 2-seriately to inner angle of each subdivision; seeds not albuminous ....XCVII. **Pedalineæ.**

Ovary 2-locular, the placentas attached to the middle of the septum; seeds almost always albuminous XCII. **Scrophularineæ.**

‡‡Carpels 1-ovuled, or rarely 2-ovuled, and if so the ovules collateral not superposed and chambers of fruit always 1-seeded, indehiscent; leaves almost always opposite:—[p. 179]

Fruit not 4-lobed or if 4-lobed drupaceous; if separating into nutlets the ovary entire ....XCIX. **Verbenaceæ.**

Fruit separating into 4 distinct nutlets or (less often) drupes; rarely 4-lobed not separating and then not drupaceous; ovary always 4-lobed ....C. **Labiatæ.**

IV. INCOMPLETÆ.

*Flowers hermaphrodite, less often (some CHENOPODIACEÆ, LORANTHACEÆ, ELÆAGNACEÆ, LAURINEÆ) 1-sexual and then (CHENOPODIACEÆ) the embryo peripheric annular or (LORANTHACEÆ) the ovule not clearly distinguishable from carpellary tissue and seed without a testa or (ELÆAGNACEÆ) the perianth fleshy and partly adherent to ovary and the stamens alternate with or twice as many as its lobes or (LAURINEÆ) the perianth-lobes 2-seriate and anthers opening by valves; perianth almost always present, usually simple, if double (LORANTHACEÆ sometimes) the outer whorl very small, the seed with no testa and the stamens opposite the lobes of the inner perianth, if absent (female flowers of some 1-sexual CHENOPODIACEÆ) the embryo peripheric annular:—[p. 183]

†Ovary inferior; seeds with copious albumen:—[p. 181]

Ovary syncarpous completely or partially 6-, rarely 5- or 4-locular; ovules very many superposed 2-seriately in each loculus or 1-seriately on the opposite sides of each placenta; seeds with a distinct testa; perianth 3-lobed, often irregular; stamens 6; scandent herbs or shrubs ....CVI. **Aristolochiaceæ.**

Ovary 1-locular; ovules 1–3; seeds with no proper testa; stamens as many as and opposite the inner or only perianth-lobes:—

Ovules three, two or solitary, pendulous from the tip or below the tip of a free funicular central axis; perianth always simple calycine or corolline; terrestrial herbs, shrubs or trees frequently semiparasitic on roots ....CXIV. **Santalaceæ.**

Ovule solitary, erect from the base of the ovary but at first not clearly distinguishable from the tissues of the inner carpellary wall; perianth corolline simple or sometimes double, the inner coloured large, the outer minute; epiphytic rarely terrestrial semiparasitic undershrubs or shrubs ....CXIII. **Loranthaceæ.**

†Ovary superior quite free from the perianth or (NYCTAGINEÆ, ELÆAGNACEÆ) with its base adherent to the persistent perianth-base; 1-locular and 1-ovuled or occasionally (most PHYTOLACCACEÆ) of several free or some THYMELÆACEÆ) of 2 syncarpous 1-ovuled carpels, rarely 1-locular with (some AMARANTACEÆ) 2–many ovules on a free-central, or with (some PROTEACEÆ) 2 collateral or more than 2 biseriately superposed ovules on a lateral placenta:—[p. 180]

‡Seeds without albumen or if albuminous (THYMELÆACEÆ sometimes) the embryo straight; trees or shrubs, very rarely herbs:—[p. 182]

Perianth-tube constricted above the ovary, subcorolline, base persistent, upper part deciduous, lobes 2 or 4 short, valvate, or limb truncate; stamens as many as and alternate with or twice as many as the perianth-lobes, anthers normal; ovary 1-locular, ovule solitary erect; trees or shrubs with scaly or stellate tomentum ....CXII. **Elæagnaceæ.**

Perianth-tube not constricted above the ovary, lobes rather long:—

Stamens as many as and opposite or twice rarely thrice as many as the perianth-lobes:—

Perianth-lobes 4, valvate, tube long or short; stamens always 4 in one series, anthers normal; ovary 1-locular, ovules solitary or 2 collateral or several 2-seriately superposed; perianth calycine or corolline; trees or shrubs

CX. **Proteaceæ.**

Perianth-lobes imbricate; stamens often in 2, rarely in 3 series; ovules pendulous:—

Perianth-tube rather long, lobes 4–5, 1-seriate; stamens as many as the lobes, sometimes fewer, sometimes twice as many, very rarely thrice as many, anthers normal; ovary

1–2-celled, each cell 1-ovuled; shrubs or trees CXI. **Thymelæaceæ.**

Perianth-tube very short, lobes either 6 or 4, 2-seriate; stamens as many or twice as many as and opposite the lobes, anthers almost always opening by valves; ovary always 1-locular; shrubs or trees or, very rarely, parasitic twining herbs ....CIX. **Laurineæ.**

‡Seeds usually with copious albumen; if albumen scanty (NYCTAGINEÆ rarely) or none (CHENOPODIACEÆ sometimes) the embryo curved and excentric or peripheric; usually herbs, rarely shrubs or trees:—[p. 181]

Leaves exstipulate or if stipules present (PHYTOLACCACEÆ occasionally) then minute or reduced to tubercles:—

Perianth tubular, base adherent to ovary, tube short or long persistent and often accrescent in fruit, limb persistent or deciduous, truncate or 3–5-toothed or -lobed, the segments plicately or simply valvate; carpels solitary, 1-ovuled, style simple ....CI. **Nyctagineæ.**

Perianth-lobes united only at the base, always imbricate:—

Perianth scarious and dry; flowers always bracteate and 2-bracteolate; filaments always connate at the base, hypogynous or perigynous; ovary 1-locular, style simple or 2–3-fid; ovule solitary or ovules 2–3; herbs or shrubs, leaves opposite or alternate ....CII. **Amarantaceæ.**

Perianth membranous, herbaceous or coriaceous, never scarious; stamens usually hypogynous; leaves alternate very rarely opposite:—

Flowers glomerulate, axillary or in spikes or panicles, or cymose, rarely strobilate or sunk in the nodes if a jointed rachis, or very rarely simply spicate, usually ebracteate, rarely bracteate, very rarely both bracteate and 2-bracteolate; herbs with membranous or herbaceous perianth, or occasionally in 1-sexual female flowers perianth absent; ovary 1-locular, 1-ovuled; style simple or 2–3-lobed, or styles 2–5 ....CIII. **Chenopodiaceæ.**

Flowers racemose, racemes terminal or axillary, usually bracteate and 2-bracteolate; trees or shrubs, rarely herbs woody at the base; perianth herbaceous or coriaceous; ovary 1-locular 1-ovuled, style simple, or carpels several apocarpous each with 1 ovule and a single style CIV. **Phytolaccaceæ.**

Leaves stipulate, stipules connate as an ochrea embracing the nodes, persistent rarely deciduous, leaving a circular scar opposite attachment of alternate or horizontal lines between the attachment of occasionally opposite leaves; perianth membranous or herbaceous, often coloured; stamens perigynous; ovary 1-locular, 1-ovuled; style-arms or styles 2–3; herbs rarely undershrubs, shrubs or trees ....CV. **Polygonaceæ.**

*Flowers 1-sexual, rarely (many Piperaceæ) hermaphrodite and then with no perianth; perianth often absent or minute, if present simple or rarely (some Euphorbiaceæ) double and then the outer whorl conspicuous with the stamens either all central or those of the outer series alternate with the inner perianth-segments, or if the stamens of the outer series opposite the inner perianth-segments then the seed provided with a testa and the plant not parasitic; ovary superior very rarely (some Urticaceæ) inferior and then the stamens opposite to and not more numerous than the perianth-segments; anthers never opening by valves:—[p. 180]

†Leafy trees, shrubs or herbs:—[p. 184]

‡Terrestrial trees, shrubs or herbs:—[p. 184]

§Leaves simple or (some Euphorbiaceæ) digitately compound, never pinnately compound:—[p. 184]

¶Ovary monocarpellary 1-locular, or if syncarpous 2- or more-locular; ovules in each carpel or loculus solitary or 2 collateral; rarely (some Piperaceæ) ovary imperfectly or almost perfectly 3–4-locular, with 6–8 ovules in each loculus 2-seriately superposed on intruded placentas and then with 2-sexual flowers:—[p. 184]

Leaves exstipulate; perianth gamophyllous calycine 3-, rarely 2–4-lobed; flowers 1-sexual, fascicled or subumbellate; stamens monadelphous, ovary 1-locular 1-ovuled in the base of the respective perianths; ovule erect; albumen copious fleshy, embryo very minute; trees with alternate leaves
CVIII. **Myristiceæ.**

Leaves stipulate or if stipules absent (Piperaceæ: *Peperomia*) the flowers 2-sexual and perianth 0:—

**Ovary 1-locular, 1-ovuled or if syncarpous (some Piperaceæ), the carpels only partly united, or if completely united the loculi incomplete and in either case the ovules in each loculus more than 2; flowers usually minute, perianth either simple or absent:—[p. 184]

††Seeds with copious floury albumen and a very minute embryo; flowers in spikes or very rarely in racemes, rarely 1-sexual; perianth almost always absent; herbs or shrubs, very rarely trees; leaves usually alternate [p. 184] ....CVII. **Piperaceæ.**

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††Seeds with little or no albumen, the embryo large and filling the seed-coats, or if albumen copious then fleshy and the embryo nearly or quite as long as the albumen; inflorescence cymose or capitate or the cymose clusters arranged in catkin-like spikes or racemes; flowers almost always 1-sexual rarely polygamous; perianth usually present with stamens as many as and opposite its lobes very rarely fewer or more; herbs, shrubs or trees, leaves alternate or opposite [p. 183] ......CXVI. **Urticaceæ.**

**Ovary 2- or more-locular with the loculi perfect and never more than 2-ovulate; rarely (some EUPHORBIACEÆ) 1-locular and then the ovules 2, or if the ovary 1-locular and 1-ovuled the stamens usually much more numerous than the perianth-lobes and those of the outer or only series alternate with the outer or only lobes of the perianth:—[p. 183]

Seeds with copious albumen, or if albumen scanty or absent the fruit a capsule, or if indehiscent drupe-like or berry-like with fleshy or leathery pericarp; inflorescence very variable but male flowers never in catkins; leaves various usually simple, generally penninerved sometimes palmately nerved, rarely digitately compound; herbs, shrubs or trees ....CXV. **Euphorbiaceæ.**

Seeds without albumen; fruit always an indehiscent 1-seeded nut with a hard or tough pericarp; male flowers in spikes or often in catkins; females in spikes or at times at the base of the male spikes; trees, leaves always simple penninerved ....CXIX. **Cupuliferæ.**

¶Ovary syncarpous 1-locular with 1-sexual flowers, placentas 2 or 4 not intruded; ovules on each placenta 4 or more 2-seriately superposed; flowers in catkins; seeds minute with coma of long hairs, albumen none; trees or shrubs; leaves simple stipulate [p. 183] ....CXX. **Salicineæ.**

§Leaves pinnately compound, stipules none; ovary 1-locular, 1-ovuled; stamens many attached to the base of the bracts of the catkin-like inflorescence; seeds with a 2–4-lobed base, without albumen; trees [p. 183] ....CXVII. **Juglandeæ.**

‡Submerged aquatic herbs with dichotomous branches and whorled leaves; flowers axillary, perianth almost membranous, much-partite; stamens numerous; ovary 1-locular, 1-ovuled; fruit a spinescent nutlet; albumen none [p. 183]..CXXI. **Ceratophylleæ.**

†Leafless trees with slender green jointed branchlets, usually deciduous, and with whorls of small adpressed slightly connate scales at

CSL

the nodes, the scales of adjacent nodes alternate; flowers in spikes; perianth-segments 1–2, small; stamen solitary; ovary 1-locular, 2-ovuled; seed solitary, albumen none [p. 183] CXVIII. **Casuarineæ.**

V. GYMNOSPERMEÆ.

Leaves or scales undivided, opposite, alternate or in clusters:—

Perianth present in both sexes, of male membranous 2-lobed, of female utricular..............................CXXII. **Gnetaceæ.**

Perianth absent from the flowers of both sexes ..CXXIII. **Coniferæ.**

Leaves very large pinnatisect, clustered at the apex of the stem; perianth absent from the flowers of both sexes ......CXXIV. **Cycadaceæ.**

VI. MONOCOTYLEDONS.

*Perianth 2-seriate the segments of both series corolline rarely (TACCACEÆ) subherbaceous and then with ovary inferior, or if only the inner series corolline its segments much larger than those of the outer calycine series; ovary syncarpous, rarely (some XYRIDEÆ), the perianth 1-seriate corolline, or (some HYDROCHARIDEÆ) 1-seriate calycine and then in aquatic herbs with syncarpous 1-locular ovary:—[p. 187]

Seeds many small, often very minute, without albumen; ovary inferior 1-locular with 3 parietal placentæ, rarely 3-locular:—

Outer perianth-segments calycine, inner corolline very rarely absent; stamens 3 or 6 or 9, rarely by further multiplication more than 9 or by abortion fewer than 3; aquatic plants with regular often 1-sexual flowers ....CXXV. **Hydrocharideæ.**

Outer perianth-segments corolline like the inner:—

Flowers regular or occasionally slightly irregular by enlargement of a segment of the outer series; stamens 6 or 3 not united to the gynœcium; marsh or land plants, frequently leafless
CXXVI. **Burmanniaceæ.**

Flowers irregular, usually markedly so, from modification of a segment of the inner series as a labellum; andrœcium and gynœcium confluent as a column bearing a single, rarely two, sessile or nearly sessile anthers..........CXXVII. **Orchidaceæ.**

Seeds conspicuous, with copious albumen:—

†Ovary inferior or if free or half-superior (some HÆMODORACEÆ) then terrestrial plants with ovary 3-locular while both series of perianth-segments are corolline and 3-merous and the embryo is not completely enclosed within the albumen:—[p. 186]

Flowers very irregular, outer series of perianth-segments calycine; perfect stamens either solitary with 5 reduced to staminodes, or 5 with a single staminode; seeds often with an arillus
CXXVIII. **Scitamineæ.**

Flowers regular or only slightly irregular:—

Outer series of perianth segments calycine; stamens 6
CXXIX. **Bromeliaceæ.**

Both series of perianth-segments corolline or rarely (some Taccaceæ) both series subherbaceous:—

Stamens 3, opposite the outer perianth-segments; flowers regular or obliquely irregular; locules of the usually 3-locular ovary many-ovuled......................CXXXI. **Irideæ.**

Stamens 6, very rarely (some Amaryllidaceæ) more numerous, or if 3 then (Amaryllidaceæ and Hæmodoraceæ sometimes) opposite the inner perianth-segments or if (*Dioscorea* sometimes) only the stamens opposite the outer perianth-segments perfect the locules of the ovary only 2-ovuled:—

Ovary 1-locular, placentas parietal, many-ovuled; stamens 6, hooded........................CXXXIII. **Taccaceæ.**

Ovary 3-locular, or if 1-locular (Amaryllidaceæ rarely), the stamens not hooded:—

Flowers 1-sexual, very small; stems scandent; stamens 6, or if 3 these opposite the outer perianth-segments
CXXXIV. **Dioscoreaceæ.**

Flowers hermaphrodite, conspicuous or very large; stems not scandent; stamens 6 rarely more or if 3 these opposite the inner perianth-segments:—

Ovary inferior, loculi many-, rarely 1–2-ovuled; embryo very small, embedded in the albumen
CXXXII. **Amaryllidaceæ.**

Ovary free in the fundus of the perianth, or half-superior, less often inferior; loculi 1–many-ovuled; embryo not completely covered by the albumen
CXXIX. **Hæmodoraceæ.**

†Ovary superior with embryo completely enclosed within the albumen; or if ovary half-inferior (some Roxburghiaceæ) the perianth 2-merous and the ovary 1-locular; if embryo not completely enclosed within the albumen, then (Pontederiaceæ) the plants aquatic or (Commelinaceæ) only the inner perianth-segments corolline; flowers regular or only slightly irregular:—[p. 185]

‡Outer as well as inner series of perianth-segments, if present, corolline:—[p. 187]

GSL

Perianth-segments of both series present and isomerous:—

Perianth-segments 2-merous; stamens 4; ovary 1-locular ·· CXXXV. **Roxburghiaceæ.**

Perianth-segments 3-merous; stamens 6 or 3:—

Terrestrial plants of very various habit; embryo small, shorter than and completely enclosed within the albumen; inflorescence very various, axillary or terminal, but never on a 1-leafed scape ....CXXXVI. **Liliaceæ.**

Aquatic erect or floating herbs; embryo cylindric, as long as and lying within a central canal in the albumen; inflorescence racemose or spicate, terminating a 1-leafed scape CXXXVII. **Pontederiaceæ.**

Perianth of the outer series either a large solitary segment embracing the inner 3-merous series, or else absent; flowers small solitary axillary in the imbricating bracts of a terminal capitulum ....CXXXVIII. **Xyrideæ.**

‡Outer series of perianth-segments calycine, inner series corolline; embryo marginal or only partially enclosed within the albumen [p. 186] ....CXXXIX. **Commelinaceæ.**

*Perianth if 2-seriate with the segments of both series calycine or if those of the inner series corolline then not larger than those of the outer series or perianth 1-seriate calycine—and then either in terrestrial plants or in aquatic herbs with apocarpous or solitary carpels,—or reduced to scales or bristles or wanting; if perianth-segments of inner series corolline and larger than the outer (ALISMACEÆ) then aquatic herbs with apocarpous gynœcium; ovary always superior:—[p. 185]

§Perianth regularly 2-seriate, segments of each series 3-merous; ovary syncarpous with albuminous seeds, or if ovary apocarpous and seeds without albumen (ALISMACEÆ) then erect scapigerous herbs with conspicuous whorled paniculate or umbellate flowers:—[p. 188]

¶Perianth with segments of both series calycine rigid or herbaceous, rarely (some JUNCACEÆ) the segments of inner series petaloid but then not larger than those of the outer; ovary syncarpous; albumen copious:—[p. 188]

Fruit a 3-valved capsule; grassy herbs with slender linear or terete leaves, or with leaves reduced to scales; embryo enclosed within the albumen ....CXLI. **Juncaceæ.**

Fruit indehiscent; shrubs or trees with flattened leaves; embryo not enclosed within the albumen:—

Leaves long simple with numerous parallel veins, erect or climbing shrubs; embryo lenticular applied outside the albumen near the hilum [p. 188] ....CXL. **Flagellarieæ.

**Leaves broadly flabellate-plicate or pinnatisect; trees or erect or climbing shrubs; embryo situated in a small pit near the periphery of the albumen; flowers in spadices [p. 187]
CXLII. **Palmeæ.**

¶Perianth with an herbaceous outer and a rather larger membranous or petaloid inner series of segments; ovary apocarpous; albumen 0, embryo horseshoe-shaped; aquatic erect herbs with conspicuous flowers disposed in whorled panicles of umbels or spikes or in simple umbels [p. 187] .... CXLVII. **Alismaceæ.**

§Perianth absent or reduced to scales or bristles; or if present and herbaceous or hyaline (NAIADACEÆ often) the segments either not regularly 3-merously 2-seriate or if, rarely, 6 in 2 rows then aquatic erect weeds with small flowers disposed in simple racemes or spikes and with a fleshy embryo that is not horseshoe-shaped:—[p. 187]

††Inflorescence of many-flowered or few-flowered spadices or spikes or racemes, or if flowers solitary then not placed in the axils of modified glumaceous bracts:—[p. 189]

Aquatic or marsh plants; flowers small not in spadices or if in spadices these not covered by spathes or spathaceous bracts:—

Freely floating minute stemless lenticular or granular herblets, rootless or with 1 or more rootlets that do not enter the soil; perianth 0; flowers minute from the margin or upper side of a frond; albumen present or 0 .... CXLVI. **Lemnaceæ.**

Fixed herbs with erect scapigerous or elongated floating or submerged leafy stems rising from a fixed usually creeping stock; perianth present or absent:—

Perianth herbaceous or hyaline, very rarely of 6 2-seriate segments and if so in small scapigerous herbs with racemose or spicate flowers, oftener of 4 or 3 or 2 segments but frequently absent; inflorescence various but rarely spadix-like and if so in herbs with leafy submerged or floating stems; albumen 0, embryo large fleshy not horseshoe-shaped
CXLVIII. **Naiadaceæ.**

Perianth of filiform bristles or membranous scales; large scapigerous herbs with creeping rootstocks emitting annual stems; leaves elongated linear parallel-veined unarmed; flowers in cylindric or globose 1-sexual superposed spadices naked or 1-bracteate at the base ...... CXLIV. **Typhaceæ.**

Terrestrial or epiphytic plants or if (some AROIDEÆ) marsh or aquatic fixed or rarely free floating herbs, the flowers in spadices subtended by a usually much modified spathe:—

Trees or erect or scandent shrubs with flowers diœcious;

perianth 0; leaves ensiform parallel-veined spinulose along the edges and the central costa beneath; spadices with spathaceous, little modified bracts, fascicled or panicled; seeds albuminous ....CXLIII. **Pandaneæ.**

Herbs, epiphytic scandent less often erect, or more usually erect terrestrial, occasionally aquatic fixed or rarely (*Pistia*) free floating, with flowers monœcious in the same spadix or less often hermaphrodite, very rarely diœcious; perianth 0, or of imbricating scales; leaves various, rarely parallel-veined and then not spinulose, rarely spinulose and then venation reticulate; spadix simple with a usually much modified and generally enveloping subtending spathe; albumen present or 0 CXLV. **Aroideæ.**

††Inflorescence of heads or spikelets composed of solitary flowers in the axils of glumaceous bracts; perianth-segments small, scale-like or 0; seeds albuminous:—[p. 188]

Flowers always 1-sexual in depressed or subglobose usually androgynous heads; ovary 3–2-locular, loculi 1-ovuled, ovules pendulous; perianth-segments 6 or fewer, scarious or hyaline; aquatic or marsh scapigerous herbs ......CXLIX. **Eriocauleæ.**

Flowers hermaphrodite or 1-sexual in spikelets with imbricating glumes; ovary 1-locular, ovules solitary erect or ascending; perianth-segments greatly modified or absent; grassy herbs:—

Stems solid; leaves 3-ranked, rarely 0; sheaths rarely ligulate, closed in front; perianth 0 or of hypogynous bristles or scales; fruit a compressed or 3-gonous nut with the seed within free; embryo inside the albumen; sedges ....CL. **Cyperaceæ.**

Stems usually hollow except at the nodes; leaves 2-ranked very rarely subspiral; sheaths almost always ligulate behind and split in front; perianth represented by a 2-nerved palea and 2 lodicules, or 0; fruit a caryopsis with the seed-coats adherent to the pericarp, very rarely free within; embryo at the base of the albumen; grasses ....CLI. **Gramineæ.**

PTERIDOPHYTA.

Leaves large in proportion to the stem, the fertile ones not confined to a particular region :—
Leaves bearing sporangia on their lower surfaces (VII. Filices) :—
Sporangia with a ring :—
Ring equatorial, encircling the sporangium :—
Ring transverse, caudex and fronds rigid CLII. **Gleicheniaceæ.**
Ring vertical or if transverse (*Trichomanes*) the caudex flexible and fronds thinly membranous........CLIII. **Polypodiaceæ.**
Ring opercular, crowning the sporangium ..CLIV. **Schizæaceæ.**
Sporangia without a ring, opening down one side :—
Vernation circinate ; sporangia marginal or dorsal CLV. **Marattiaceæ.**
Vernation erect ; sporangia spicate ....CLVI. **Ophioglossaceæ.**
Leaves bearing sporangia on their upper surfaces (VIII. Rhizocarpeæ):—
Fugacious floating annual aquatic herbs ....CLVII. **Salviniaceæ.**
Perennial marsh-herbs with wide-creeping slender rootstocks CLVIII. **Marsiliaceæ.**
Leaves small in proportion to the stem, the fertile ones very often confined to a particular region :—
Leaves in whorls, the fertile ones peltate forming a spike at the apex of the stem bearing sporangia on their inner faces (IX. Equisetineæ) CLIX. **Equisetaceæ.**
Leaves not whorled, the fertile ones flat with sporangia axillary (X. Lycopodineæ) :—
Sporangia uniform ....CLX. **Lycopodiaceæ.**
Sporangia of two kinds. ....CLXI. **Selaginellaceæ.**

IV. BENGAL PLANTS.

A.—PHANEROGAMIA.

I.—THALAMIFLORÆ.

Sepals herbaceous, rarely petaloid, distinct, imbricate or valvate, or connate in a tube with imbricate or valvate or open lobes, free or, rarely, with the base of the tube adnate to the base of the ovary. *Torus* small, or raised or stalk-like, or thickened and fleshy or crowned by a disk, annular or cupular or flattened, entire or lobed or broken into glands, free or adnate to calyx and ovary, or to ovary alone, rarely to calyx alone. *Petals* 1–2-seriate, unlike the sepals, or 2–many-seriate passing gradually from the sepals, or as many as sepals or fewer by abortion, inserted on the torus or adnate to the base of the calyx external to the disk, or sometimes when disk absent adnate at the base to the stamens. *Stamens* numerous or few, inserted on the torus or rarely on the base of the calyx, free or adnate to base of petals, or few and inserted around, upon or within the disk. *Carpels* free or connate. or rarely more or less embedded in the fleshy torus, or immersed in the thickened disk.

Order I. RANUNCULACEÆ.

Herbs, rarely shrubs, annual or perennial; *leaves* radical or alternate, rarely opposite; simple, rarely compound; stipules 0, or adnate to petiole. *Flowers* regular or irregular, hermaphrodite or 1-sexual. *Disk* very rare (*Pæonia* only). *Sepals* 5 or more, rarely 2–4, deciduous, often petaloid, imbricate, rarely valvate in bud. *Petals* 0, or 5 or more, rarely 3, often minute or deformed. *Stamens* many, hypogynous; anthers adnate; dehiscence longitudinal. *Carpels* many, rarely 1, usually free, 1-celled; stigma simple; ovules 1 or more on the ventral suture, anatropous, erect with a ventral or pendulous with a dorsal raphe. *Fruit* of 1-seeded achenes or many-seeded follicles. *Seed* small; albumen horny, rarely fleshy; embryo minute.

Leaves opposite; sepals valvate; climbing shrubs:—
  Petals 0; petiole not produced as a tendril ....**Clematis.**
  Petals many; petiole produced as a tendril......................**Naravelia.**
Leaves alternate; sepals imbricate; herbs:—
  Carpels free, 1-ovuled:—
    Leaves compound; petals 0; ovule pendulous ....**Thalictrum.**
    Leaves simple; petals 5; ovule erect ....**Ranunculus.**
  Carpels united at base; ovules several; leaves much dissected **Nigella.**

1. **Clematis** Linn.

Woody, usually climbing undershrubs; *leaves* opposite, usually compound, petiole sometimes twining but not produced as a tendril; stipules 0. *Flowers* axillary or terminal, solitary, fascicled or paniculate. *Sepals* usually 4, valvate, petaloid. *Petals* 0. *Stamens* numerous. *Carpels* many, each with 1 pendulous ovule; styles usually long, bearded. *Fruit* a head of sessile or stalked achenes, each with the style persistent as a long twisted pilose tail or a long, straight, naked beak.

Flowers solitary axillary; achenes with long, straight beaks, not feathery ....*Cadmia.*
Flowers in axillary panicles; achenes with long feathery tails:—
  Sepals spreading from the base:—
    Filaments glabrous; flower not exceeding a half-in. across...*Gouriana.*
    Filaments hairy; flower more than 1·5 in. across ....*Wightiana.*
  Sepals erect with recurved tips; filaments hairy; flower more than 1·5 in. across ....*nutans.*

1. CLEMATIS CADMIA Ham.; F. B. I. i. 2. *Thalictrum bracteatum* F. I. ii. 671.

   Tropical jungles of N. and E. Bengal.

   A climber. *Vernac.* Ban jelaki, Ban maris.

2. CLEMATIS GOURIANA Roxb.; F. I. ii. 670; F. B. I. i. 4; E. D. C. 1356.

   N. Bengal, ruins of Gour; Chota Nagpur, on Parasnath and other mountains.

   A climber.

3. Clematis Wightiana Wall.; F. B. I. i. 5.
Orissa, on mountains.
A climber.

4. Clematis nutans Royle; F. B. I. i. 5.
Chota Nagpur, on Parasnath and other mountains.
A climber. *Santal*. Bonga khanti.

2. **Naravelia** DC.

Woody climbing undershrubs; *leaves* opposite, 2-foliolate, petiole ending in a tendril; stipules 0. *Flowers* paniculate. *Sepals* 4–5, valvate, petaloid. *Petals* many, linear or clavate. *Stamens* numerous. *Carpels* many, each with 1 pendulous ovule; styles long, bearded. *Fruit* a head of stalked achenes, each with the style persistent as a long twisted pilose tail.

5. Naravelia zeylanica DC.; F. B. I. i. 7; E. D. N. 8. *Atragene zeylanica* F. I. ii. 670.
Hedges and thickets, general.
A climber. *Beng*. Chagul-bati, murcha (*Sundribuns*).

3. **Thalictrum** Linn.

Perennial rigid herbs; *leaves* alternate, compound; petiole sheathing, often auricled or stipulate. *Flowers* in racemes or panicles, often polygamous. *Sepals* 4–5, imbricate, petaloid. *Petals* 0. *Stamens* numerous. *Carpels* many or few, each with 1 pendulous ovule; styles distinct, sometimes persistent. *Fruit* a head of sessile or stalked achenes.

6. Thalictrum javanicum Bl.; F. B. I. i. 13.
Chota Nagpur, on Parasnath.
A slender, stiff herb.

4. **Ranunculus** Linn.

Annual or perennial herbs; *leaves* alternate, entire, lobed or dissected; stipules membranous or 0. *Flowers* usually panicled, yellow or white. *Sepals* 3–5, caducous, imbricate. *Petals* usually 5, occasionally 0, often glandular at base. *Stamens* numerous. *Carpels* many, each with 1 ascending ovule; styles short. *Fruit* a head or spikelet of beaked achenes.

7. Ranunculus sceleratus Linn.; F. B. I. i. 19; E. D. R. 28. *R. indicus* F. I. ii. 671.

Banks of rivers and nullahs, fairly general.
An acrid weed. *Vernac.* Polica (*Tirhut*).

5. **Nigella** Linn.

Annual erect herbs; *leaves* alternate, 2-pinnately dissected; stipules small. *Flowers* terminal peduncled, white, blue or yellowish, sometimes with an involucre of floral leaves. *Sepals* 5, regular, deciduous, imbricate, petaloid. *Petals* 5, with long claw and small 2-fid limb. *Stamens* numerous. *Carpels* 3–10, sessile, connate below, each with several horizontal ovules 2-seriate on the ventral suture; styles usually long. *Fruit* a capsule dehiscing along ventral suture of free portion of individual carpels.

8. NIGELLA SATIVA Linn.; E. D. N. 158. *N. indica* F. I. ii. 646.
In cultivated ground, spontaneous, especially in the western parts.
A crop, also occurring as a weed. *Beng.* Mugrela, kaljira.

Order II. DILLENIACEÆ.

Trees or shrubs, sometimes climbing, or herbs; *leaves* alternate, simple, entire or toothed; stipules 0, but petiole sheathing, more rarely with lateral deciduous stipules. *Flowers* regular, hermaphrodite, often showy, white or yellow. *Disk* 0. *Sepals* 5, rarely more or fewer, imbricate, persistent, often accrescent. *Petals* 5, rarely more or fewer, caducous. *Stamens* many, hypogynous; anthers innate; dehiscence longitudinal, introrse or lateral, or by terminal pores. *Carpels* 1–many, free or cohering; styles free, stigma simple; ovules solitary amphitropous, or few ascending, or numerous on the ventral suture. *Fruit* indehiscent berry-like, or dehiscent follicular. *Seeds* 1 or few, arillate, rarely rather numerous and (*Dillenia*) exarillate; testa crustaceous, raphe short; albumen fleshy; embryo minute.

Climbing shrub; carpel 1; filaments expanded, anther-cells short, remote, oblique ....**Delima.**
Trees; carpels 5–20; filaments slender, anther-cells parallel ...**Dillenia.**

6. **Delima** Linn.

Woody climber; *leaves* scabrid, parallel-nerved from the midrib. *Flowers* numerous, hermaphrodite, white, in terminal panicles.

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Sepals 5. *Petals* 2–5. *Stamens* numerous; filaments dilated upwards, anther-cells widely diverging. *Carpel* solitary, subglobose, narrowed into a subulate style; ovules 2–3, ascending. *Fruit* an ovoid, coriaceous, 1-seeded follicle. *Seed* with a cup-like, toothed arillus.

9. DELIMA SARMENTOSA Linn.; F. B. I. i. 31; E. D. D. 243. *Tetracera sarmentosa* F. I. ii. 645.
Tippera; Chittagong.
A climber.

7. **Dillenia** Linn.

Trees; *leaves* large, simple, parallel-nerved from the midrib; stipules 0. *Flowers* appearing with or before the leaves, large or very large, solitary or fascicled, yellow or white. *Sepals* 5, at first spreading, afterwards connivent, accrescent. *Petals* 5, caducous. *Stamens* numerous; anthers linear, dehiscence by small chinks or pores; inner introrse, outer extrorse. *Carpels* 5–20, coherent in the centre; ovules many. *Fruits* globose, composed of an accrescent calyx enclosing the matured indehiscent carpels. *Seeds* not arillate, pulpy or not.

Flowers with the leaves, large (6 in. across), solitary, petals white; carpels about 20; fruit as large as the human fist ....*indica*.
Flowers before the leaves, petals yellow :—
- Flowers small, fascicled; carpels 5–7; fruit not larger than a plum :—
  - Pedicels with scattered bracteoles near the middle; flowers 2 in. across; carpels 5–7 ....*scabrella*.
  - Pedicels without bracteoles; flowers 1 in. across; carpels 5...*pentagyna*.
- Flower large, solitary, 4–5 in. across; carpels 8–12; fruit as large as a small apple ....*aurea*.

10. DILLENIA INDICA Linn.; F. B. I. i. 36; E. D. D. 428. *D. speciosa* F. I. ii. 650.
Planted, but also readily self-sown in all the provinces.
A tree. *Beng.* Chálta, chálitá, hargéza; *Santal.* Korkot; *Uriya* Oao, rai.

11. DILLENIA SCABRELLA Roxb.; F. I. ii. 653; F. B. I. i. 38.
Chittagong.
A tree. *Beng.* Hargéza (*Chittagong*).

12. DILLENIA PENTAGYNA Roxb.; F. I. ii. 652; F. B. I. i. 38; E. D. D. 438. *D. augusta* F. I. ii. 652.

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Behar and Chota Nagpur, common; W. Bengal, rare.
A stunted tree. *Bihar.* Agor; *Beng.* Karkotta; *Santal.* Korkot; *Uriya* Rai.

13. Dillenia aurea Sm.; F. B. I. i. 37; E. D. D. 428.
N. Bengal, submontane forests.
A spreading tree. *Vernac.* Chammagai.

Order III. MAGNOLIACEÆ.

Trees or shrubs, sometimes climbing, usually aromatic; *leaves* alternate, simple, entire, rarely toothed; stipules convolute or 0. *Flowers* hermaphrodite, rarely 1-sexual, axillary or terminal, often showy, yellow, white, or pink. *Disk* 0. *Perianth* of similar sepals and petals, hypogynous, imbricate, in 3 or more ternate whorls, caducous, rarely 0. *Stamens* many, hypogynous; filaments round or flat, free or connate; anthers basifixed; dehiscence longitudinal, variously introrse, lateral or extrose. *Carpels* many, free or partly united, in 1 or more whorls on a short or long torus; style usually short, stigmatic on inner face; ovules 2–many, anatropous or amphitropous on the ventral suture. *Fruit* a head or cone of baccate, rarely woody, indehiscent, or of dehiscent follicular carpels. *Seeds* 1 or few, funicle sometimes slender; testa crustaceous and closely united to tegmen, or fleshy with tegmen distinct; albumen granular or fleshy or oily; embryo minute.

Carpels in a loose spike on a stalked gynophore	**Michelia.**
Carpels densely packed on a sessile gynophore	**Magnolia.**

8. **Michelia** Linn.

Trees; *leaves* evergreen or deciduous; buds enclosed in the connate convolute caducous stipules. *Flowers* solitary, usually axillary. *Perianth* of 9–20, at least 3-seriate, similar sepals and petals. *Stamens* numerous, many-seriate; filaments flat, anthers adnate and introrse. *Carpels* many in a loose spike on a stalked gynophore; ovules 2 or more. *Fruit* a lax or dense elongated spike of coriaceous follicles opening by the dorsal suture. *Seeds* with a long funicle, pendulous; testa fleshy; albumen oily.

14. MICHELIA CHAMPACA Linn.; F. I. ii. 656; F. B. I. i. 42; E. D. M. 517.

Planted near villages and temples.

A tree; flowers yellow, very fragrant. *Hind.* and *Beng.* Champá, champaka; *Uriya* Kanchanamu, chámpá.

9. **Magnolia** Linn.

Trees or shrubs; *leaves* evergreen or deciduous; buds enclosed in the connate convolute caducous stipules. *Flowers* large terminal. *Sepals* 3. *Petals* 6–12, 2–4-seriate. *Stamens* numerous, many-seriate; filaments flat, anthers adnate and introrse. *Carpels* many, imbricate on a sessile gynophore; ovules 2. *Fruit* an elongated spike of persistent, adnate, 1–2-seeded follicles opening by the dorsal suture. *Seeds* with a long funicle, pendulous; testa fleshy; albumen oily.

15. MAGNOLIA PTEROCARPA Roxb. *M. sphenocarpa* F. B. I. i. 41; E. D. M. 51. *Liriodendron grandiflorum* F. I. ii. 653.

Chittagong.

A tree; flowers large, white, fragrant. *Beng.* Dulichamp.

Order IV. ANONACEÆ.

Trees or shrubs, often climbing, sometimes aromatic; *leaves* alternate, simple, entire; stipules 0. *Flowers* hermaphrodite, rarely 1-sexual. *Disk* 0. *Sepals* 3, usually valvate, free or connate. *Petals* hypogynous, in 2 or 1 3-merous whorls. *Stamens* many, rarely few, hypogynous, close-set on the torus; filaments short or 0; anthers adnate, connective produced in an oblong or truncate head; dehiscence longitudinal, extrorse or sublateral. *Carpels* 1–many, free or rarely (*Anona*) united, but with stigmas distinct; style short or 0, stigma capitate or oblong, entire or sulcate or 2-lobed; ovules 1 or more, basal or on the ventral suture, anatropous with ventral raphe. *Fruit* of 1 or more, sessile or stipitate, 1–many-seeded, usually indehiscent carpels; rarely (*Anona*) the carpels confluent in a subglobose many-celled, many-seeded mass. *Seeds* large, testa coriaceous or crustaceous; albumen dense, ruminate; embryo small, sometimes minute.

Carpels not confluent in front :—
Petals imbricate :—
Sepals imbricate ....**Sageræa.**
Sepals valvate ....**Uvaria.**
Petals valvate :—
Anther-cells not concealed by overlapping connective :—
Petals of inner series larger than those of outer :—
Ovules 6 or more ....**Saccopetalum.**
Ovules 1–2 ....**Miliusa.**
Petals subequal, ovules 4–8......................................**Alphonsea.**
Anther-cells concealed by overlapping connective :—
Peduncles hooked; petals connivent at concave base...**Artabotrys.**
Peduncles not hooked :—
Petals of both series flat, lanceolate, subequal, spreading from the base :—
Ovules many, 2-seriate ....**Cananga.**
Ovules definite :—
Ovules 2–6, 1-seriate on the ventral suture ....**Unona.**
Ovules 1–2, basal or subbasal........................**Polyalthia.**
Petals of the two series unequal :—
Petals of outer series spreading, those of inner concave, connivent, overarching stamens and pistil ....**Mitrephora.**
Petals of outer series thick, rigid, connivent, larger than those of inner ....**Melodorum.**
Carpels confluent; petals valvate, those of outer series thick, rigid, connivent, larger than those of inner; anthers concealed by overlapping connective ....**Anona.**

10. **Sageræa** Dalz.

Trees; *leaves* shining, glabrous. *Flowers* small, axillary, or fascicled on woody tubercles, hermaphrodite or 1-sexual. *Sepals* 3, orbicular or ovate, imbricate. *Petals* 6, imbricate in 2 series, nearly equal, usually orbicular, very concave. *Stamens* 6–21, imbricate in 2 or more series, broadly oblong, thick, fleshy; anther-cells dorsal, oblong, connective produced. *Carpels* 3–6; style short, stigma obtuse or capitate; ovules 6–8 on the ventral suture. *Fruit* of discrete, globose or ovoid ripe carpels.

16. SAGERÆA LISTERI King.

Chittagong.

A tree; stamens 9; ripe carpels an inch long; seeds about 12 in 2 rows. *Beng.* Dháman (*Chittagong*).

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11. **Uvaria** Linn.

Scandent shrubs; *leaves* dull, pubescence stellate. *Flowers* terminal or leaf-opposed, rarely axillary, solitary or in cymes or fascicles, yellow, purple or brown. *Sepals* 3, valvate, often connate below. *Petals* 6, imbricate, in 2 series, orbicular, ovate or oblong, sometimes connate at the base. *Stamens* numerous; connective ovate-oblong, truncate, or subfoliaceous. *Thalamus* depressed, tomentose. *Carpels* many, linear-oblong; style short, thick; ovules numerous, 2-seriate, rarely few, 1-seriate. *Fruit* a head of numerous dry or berry-like free ripe carpels, each few- to many-seeded.

Leaves more or less pubescent :—
  Leaves over 6 in. long, sparsely pubescent beneath; flowers at least 1·5 in. across; carpels at least an inch long, many-seeded :—
    Peduncles 1–2-fld.; flowers 2 in. across, brick-red, pedicels (1 in.) longer than buds; carpels globose or oblong, shorter than the 1·5 in. long stipe .... *Hamiltoni.*
    Peduncles many-fld.; flowers 2 in. across, dull purple-red, pedicels (·3 in.) shorter than buds; carpels oblong, exceeding the ·4 in. long stipe .... *macrophylla.*
  Leaves under 6 in. long, densely velvety beneath; peduncles 1–2-fld.; flowers under 1·5 in. across; carpels less than ·5 in. long, narrowly ovoid, with very short stipe; 1–2-seeded .... *ferruginea.*
Leaves quite glabrous on both sides, 4–9 in. long; flowers 1 in. across; carpels 1 in. long, ovoid or oblong, stalk over 1 in. long .... *Hookeri.*

17. Uvaria Hamiltoni Hook. f. & Thoms.; F. B. I. i. 48.
  Behar, Monghyr; N. Bengal; E. Bengal, Madhupur jungles.
  A climber.

18. Uvaria macrophylla Roxb.; F. I. ii. 663; F. B. I. i. 49; E. D. U. 69.
  Chittagong.
  A climber. *Beng.* Bagh-[illegible]

19. Uvaria ferruginea Ham. *Ellipeia ferruginea* F. B. I. ii. 52.
  Tippera.
  A climber.

20. Uvaria Hookeri King. *U. Narum* var. *macrophylla* F. B. I. i. 50.
Orissa, Khurda.
A climber. *Uriya* Gaichiria.

12. **Saccopetalum** Benn.

Trees; *leaves* deciduous, pubescent. *Flowers* solitary or fascicled, axillary. *Sepals* 3, valvate, small. *Petals* 6, 2-seriate, valvate; outer small, sepal-like, inner much larger, erect or connivent, saccate at base. *Stamens* numerous; anther-cells contiguous, dorsal, connective much produced. *Carpels* many; ovules 6 or more. *Fruit* of subglobose long-stalked ripe carpels.

Peduncles very short (·25 in. long), solitary in old axils; inner petals oblong-lanceolate; carpels glabrous................................*longiflorum*.
Peduncles very long (2–3 in. long), cymose, leaf-opposed; inner petals oblong-obtuse; carpels puberulous ....*tomentosum*.

21. Saccopetalum longiflorum Hook. f. & Thoms.; F. B. I. i. 88.
N. Bengal, Purnea; Chittagong, thence introduced to the Calcutta Garden in 1810, but not found wild since.
A tree.

22. Saccopetalum tomentosum Hook. f. & Thoms.; F. B. I. i. 88; E. D. S. 487. *Uvaria tomentosa* F. I. ii. 667.
Behar; Chota Nagpur; Orissa.
A tree. *Hind.* Kari; *Kol.* Lapkari; *Santal.* Omé; *Uriya* Patmossu.

13. **Miliusa** Leschen.

Trees or shrubs. *Flowers* hermaphrodite or 1-sexual, green or red, solitary, fascicled or cymose, axillary or extra-axillary. *Sepals* 3, valvate, small. *Petals* 6, 2-seriate, valvate; outer smaller, sepal-like, inner connate when young, at length free. *Stamens* few or numerous; anthers subdidymous, cells contiguous, ovoid; dehiscence extrorse; connective slightly apiculate. *Carpels* many, linear-oblong; style short, oblong; ovules usually 1–2, rarely 3–4. *Fruit* of globose or oblong 1- or more-seeded ripe carpels.

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Small tree; leaves glabrous above, glabrous or tomentose beneath; flowers 1–3 together, axillary, diœcious; inner petals glabrous on both sides; carpels glabrous, ·5 in. long, shorter than the glabrous stipe ....*Roxburghiana.*

Tall tree; leaves tomentose on both surfaces; flowers racemose, hermaphrodite; inner petals densely tomentose outside, glabrous inside; carpels pubescent, ·75 in. long, rather longer than the pubescent stipe...*velutina.*

23. Miliusa Roxburghiana Hook. f. & Thoms.; F. B. I. i. 87. *Uvaria dioica* F. I. ii. 659.

    Tippera; Chittagong.

    A small tree. *Vernac.* Tasbi.

24. Miliusa velutina Hook. f. & Thoms.; F. B. I. i. 87; E. D. M. 545. *Uvaria villosa* F. I. ii. 665.

    Behar; Chota Nagpur, common; N. Bengal, Maldah; Orissa, Khurda.

    A large tree. *Hind.* Dom-sal; *Kol.* and *Santal.* Omé.

14. **Alphonsea** Hook. f. & Thoms.

Tall trees; *leaves* thick, leathery, glabrous, shining. *Flowers* small or medium, in peduncled fascicles, leaf-opposed or extra-axillary. *Sepals* 3, valvate, small. *Petals* 6, 2-seriate, valvate, larger than the sepals, subequal or the inner smaller. *Stamens* numerous, loose; anther-cells contiguous dorsal, connective apiculate; dehiscence extrorse. *Carpels* 1 or more; style oblong or depressed; ovules 2-seriate on the ventral suture, 4–8 in each carpel. *Fruit* of subsessile or stalked ripe carpels.

Leaves narrow-oblong, long-acuminate; flowers in fascicled short racemes; pedicels ·5–1 in. long, petals ·75 in. long; stipe 1 in., almost as long as ripe carpels...*ventricosa.*

Leaves ovate-oblong, abruptly acuminate; flowers in dense leaf-opposed fascicles; pedicels very short; style ·2 in., much shorter than ripe carpels ....*lutea.*

25. Alphonsea ventricosa Hook. f. & Thoms.; F. B. I. i. 89. *Uvaria ventricosa* F. I. ii. 658.

    Chittagong.

    A tall tree; leaves 6–10 in. long.

26. Alphonsea lutea Hook. f. & Thoms.; F. B. I. i. 89. *Uvaria lutea* F. I. ii. 666.

    Orissa.

    A tree; leaves 3–5 in. long.

15. **Artabotrys** R. Br.

Scandent shrubs; *leaves* shining, glabrous. *Flowers* solitary or fascicled, on woody hooked recurved peduncular branches. *Sepals* 3, valvate. *Petals* 6, valvate, in two series, with connivent concave bases, and flat subterete or clavate spreading limb. *Stamens* numerous; oblong or cuneate, connective truncate or produced; anther-cells dorsal; dehiscence extrorse. *Carpels* few to many; style oblong or columnar; ovules 2, collateral, erect. *Fruit* a head of berry-like free ripe carpels.

Flowers over 1·5 in. long, solitary or geminate on the hooked peduncle; petals broad-lanceolate, pubescent near base when young, glabrous when expanded; carpels 1·5 in. long............................*odoratissimus.*
Flowers about ·5 in. long, numerous on the hooked peduncle; petals cylindric or subclavate, grey-pubescent throughout; carpels ·75 in. long ....*suaveolens.*

27. ARTABOTRYS ODORATISSIMUS R. Br.; F. B. I. i. 54; E. D. A. 1431. *Uvaria odoratissima* F. I. ii. 666.
Planted in gardens, especially in C. Bengal.
A climber. *Beng.* Kantali-champ, from the fancied resemblance of its odour to that of the Jak.

28. ARTABOTRYS SUAVEOLENS Bl.; F. B. I. i. 55; E. D. A. 1434.
Chittagong.
A climber.

16. **Cananga** Rumph.

Tall trees, with large leaves. *Flowers* large, yellow, solitary or fascicled, on short axillary peduncles. *Sepals* 3, ovate or triangular, valvate. *Petals* 6, valvate, in two series, subequal or the inner smaller, long, flat. *Stamens* numerous, linear; anther-cells close together, extrorse, connective produced as a lanceolate process. *Carpels* many; style oblong; stigma subcapitate; ovules many, 2-seriate. *Fruit* a head of berry-like free ripe carpels. *Seeds* numerous; testa crustaceous, sending numerous spine-like processes into the albumen.

29. CANANGA ODORATA Hook. f. & Thoms.; F. B. I. i. 56; E. D. C. 271. *Uvaria odorata* F. I. ii. 661.
Planted in gardens, especially in C. Bengal.
A tall tree.

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17. Unona Linn.

Trees, or erect or climbing shrubs. *Flowers* usually solitary, axillary, leaf-opposed, or terminal. *Sepals* 3, valvate. *Petals* 6, 2-seriate, valvate or open in bud, sometimes the inner series 0. *Stamens* numerous, cuneate; the anther-cells linear, apex of connective truncate or rounded; dehiscence extrorse. *Carpels* many; style ovoid or oblong recurved grooved; ovules 2–8 in each, 1-seriate rarely sub-2-seriate. *Fruit* of many ripe carpels, usually elongated and constricted between the seeds.

Petals 6, 2-seriate:—
  Climbing; outer petals under 1·5 in. long; peduncles 2-fld., short, under ·5 in. long ....*Dunalii*.
  Shrubby; outer petals over 2 in. long; peduncles 1-fld., slender, from 1–2 in. long ....*discolor*.
Petals 3, 1-seriate, the inner series wanting; a slender tree; petals 6 in. long; peduncles slender, often very long, up to 10 in. ....*longiflora*.

30. Unona Dunalii Wall.; F. B. I. ii. 58.
Chittagong.
A large glabrous climber.

31. Unona discolor Vahl; F. I. ii. 669; F. B. I. i. 59. *Uvaria cordifolia* F. I. ii. 662.
C. Bengal; Orissa; Chittagong.
A spreading branching shrub.

32. Unona longiflora Roxb.; F. I. ii. 668; F. B. I. i. 61.
Chittagong.
A slender tree.

18. Polyalthia Bl.

Trees or shrubs. *Flowers* solitary, few or many, in axils of present or of fallen leaves, or on woody tubercles, or extra-axillary. *Sepals* 3, valvate or sometimes subimbricate. *Petals* 6, 2-seriate, valvate, flat or the inner vaulted, ovate or elongated. *Stamens* numerous, cuneate, anther-cells remote; dehiscence extrorse. *Carpels* many; style usually oblong; ovules in each 1–2, basal erect, or subbasal ascending. *Fruit* of berry-like 1-seeded ripe carpels.

*Branches and leaves glabrous; flowers many, fascicled; petals linear; carpels ovoid:—[p. 204]

Leaves narrow-lanceolate, apex tapering, margin undulate; petals ·75–1 in. long; carpels fleshy, black, ·75 in. long, exceeding their stipe *longifolia*.

Leaves ovate-oblong, apex acute, margin not waved; petals 1–1·25 in. long; carpels fleshy, orange, 1·5 in. long, equalling their stipe *simiarum*.

*Branches and leaves beneath pubescent; flowers few on woody tubercles; petals ovate, ·5 in. long; carpels spherical:—[p. 203]

Leaves lanceolate-acuminate; peduncles 1–3-fld., tubercles axillary; carpels ·4 in. across, dark red, their stipe 1 in. long............*cerasoides*.

Leaves oblong-obtuse; peduncles 1–2-fld., tubercles extra-axillary; carpels ·25 in. in diam., their stipe ·25 in. long ....*suberosa*.

33. POLYALTHIA LONGIFOLIA Benth. & Hook. f.; F. B. I. i. 62; E. D. P. 1052. *Uvaria longifolia* F. I. ii. 664.

Planted, especially as an avenue-tree, in C. Bengal and Tirhut.

A tall tree. *Hind.* and *Behar.* Asok; *Beng.* Debdaru; *Uriya* Asoka, ásupál, debdaru.

34. POLYALTHIA SIMIARUM Benth. & Hook. f.; F. B. I. i. 63.

Chittagong; Orissa, Khurda; N. Bengal, Duars.

A tree. *Vernac.* Boga-kainla (*Duars*); *Uriya* Mongai.

35. POLYALTHIA CERASOIDES Benth. & Hook. f.; F. B. I. i. 63; E. D. P. 1048. *Uvaria cerasoides* F. I. ii. 666.

Behar; Chota Nagpur; W. Bengal, common; C. Bengal and E. Bengal, only in thickets near villages.

A tree. *Hind.* Kudumí; *Santal.* Panjon.

36. POLYALTHIA SUBEROSA Benth. & Hook. f.; F. B. I. i. 65; E. D. P. 1058. *Uvaria suberosa* F. I. ii. 667.

Behar; N. and W. Bengal, common; C. Bengal, occasional.

A shrub or small tree. *Beng.* Bara-chali; *Santal.* Sandiomé.

19. **Mitrephora** Bl.

Trees; *leaves* leathery, strongly nerved, plicate in bud. *Flowers* hermaphrodite or sometimes 1-sexual, terminal or leaf-opposed. *Sepals* 3, orbicular or ovate. *Petals* 6, 2-seriate, valvate, outer ovate thin, the veined inner thicker, clawed, vaulted, connate above. *Stamens* numerous, oblong-cuneate at apex; anther-cells remote; dehiscence extrorse. *Carpels* many, oblong; style oblong or clavate, furrowed on inner face; ovules 4 or more, 2-seriate on the ventral suture. *Fruit* of stalked or subsessile, globose or ovoid, free ripe carpels.

37. Mitrephora tomentosa Hook. f. & Thoms.; F. B. I. i. 76.
Chittagong.
A tree.

20. **Melodorum** Dunal.

Shrubs, climbing; *leaves* with strong parallel nerves from the midrib. *Flowers* terminal, axillary, or leaf-opposed, solitary, fascicled or paniculate, 3-gonous in bud. *Sepals* 3, valvate, connate below. *Petals* 6, 2-seriate, valvate, outer subconvex or angular, inner triquetrous above hollowed below on the inner face. *Stamens* numerous; anther-cells contiguous; dehiscence extrorse; top of connective truncate or rounded. *Carpels* many; style oblong; ovules in each 2 or more. *Fruit* of berry-like ripe carpels.

Flowers 1·25 in. long, axillary or in terminal 5–6-fld. leafless panicles; outer petals oblong-acuminate, tomentose outside, hoary within *rubiginosum*.

Flowers ·25 in. long, in 3–7-fld. leaf-opposed cymes; outer petals ovate, silky outside, faintly puberulous within ....*polyanthum*.

38. Melodorum rubiginosum Hook. f. & Thoms.; F. B. I. i. 79.
Chittagong.
A large climber.

39. Melodorum polyanthum Hook. f. & Thoms.; F. B. I. i. 81.
Chittagong.
A large climber.

21. **Anona** Linn.

Trees or shrubs. *Flowers* solitary or leaf-opposed. *Sepals* 3, valvate, small. *Petals* 6, 2-seriate, the inner much smaller than the outer or 3, the inner series absent; the outer thick, triquetrous, concave at base. *Stamens* numerous; anther-cells narrow, dorsal, contiguous; top of connective ovoid. *Carpels* many, subconnate; style oblong; ovule solitary, erect. *Fruit* a many-celled globose or ovoid mass of confluent ripe carpels.

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Leaves usually obtuse; peduncles generally solitary; fruit ovoid with projecting convex ovoid areoles ....*squamosa.*
Leaves acuminate; peduncles generally 2–4 together; fruit subglobose with flat 5-cornered areoles ....*reticulata.*

40. ANONA SQUAMOSA Linn.; F. I. ii. 657; F. B. I. i. 78; E. D. A. 1166.

Near villages, planted and sometimes self-sown, common. A small tree. *Beng.* Ata.—Custard Apple of English in India; Sweet Sop of English in West Indies.

41. ANONA RETICULATA Linn.; F. I. ii. 657; F. B. I. i. 78; E. D. A. 1158.

Near villages, planted and oftener self-sown, very common. A small tree. *Santal.* Gom; *Beng.* Nona.—Bullock's Heart; Custard Apple of English in West Indies.

Order V. MENISPERMACEÆ.

Shrubs or undershrubs, climbing or twining rarely sarmentose; *leaves* alternate, entire or lobed, usually palminerved, frequently peltate; stipules 0. *Flowers* 1-sexual diœcious, small or minute, sometimes 3-bracteolate, in racemes, cymes or fascicles, or solitary. *Disk* 0. *Sepals* 6 (rarely 1–4 or 9–12), almost always free, imbricate, 2-seriate, the outer whorl often minute. *Petals* 6, 2-seriate (rarely 5–1 or 0), free or connate. ♂ *Stamens* hypogynous, usually 1 opposite each petal; filaments free or connate; anthers 2-celled, usually adnate; dehiscence longitudinal, extrorse or lateral, rarely introrse; rudimentary carpels minute or 0. ♀ *Staminodes* 6 or 0. *Carpels* 3 (rarely 1, or 6–12), free; style terminal, simple or divided; ovule 1 or rarely (*Fibraurea*) 2, on the ventral suture, amphitropous rarely anatropous. *Fruit* of drupaceous ripe carpels with a subterminal or (from excentric growth) subbasal style-scar. *Seed* campylotropous, hooked or reniform; endocarp often intruded in the concavity; albumen ruminate or uniform or 0; embryo small or large, curved or rarely straight.

* ♂ stamens connate:—[p. 207]
  † ♂ anthers 6; ♂ ♀ perianth-segments all free:—[p. 207]
    ‡ ♀ carpels 3, accompanied by staminodes:—[p. 207]
      ♂ ♀ petals 6; sepals 6; ♀ staminodes 6 ....**Parabæna.**
      ♂ ♀ petals 0; sepals 6; ♀ staminodes 9..................**Anamirta.**

‡ ♀ carpel 1, staminodes 0; ♂ petals 3–5; sepals 6–10; ♀ petals 3–5; sepals 3–5 [p. 206] ....**Stephania.**
† ♂ anthers 4; petals connate 4; sepals 4; ♀ petal 1; sepal 1 [p. 206] **Cissampelos.**
* ♂ stamens free; perianth-segments free; capels 3 or more:—[p. 206]
  ♂ ♀ petals 6:—
    ♂ ♀ sepals 6:—
      ♂ anthers 9 ....**Pycnarrhena.**
      ♂ anthers 6:—
        Carpels in male 0:—
          ♂ stamens with thickened apices, anthers dehiscing obliquely; ♀ carpels 3, styles forked ....**Tinospora.**
          ♂ stamens with subglobose anthers dehiscing transversely; ♀ carpels 3–6, styles cylindric ....**Cocculus.**
        Carpels in male 3, rudimentary; ♂ stamens subcylindric, anthers dehiscing vertically; ♀ carpels 9–12, styles subulate **Tiliacora.**
    ♂ ♀ sepals 9–12; ♂ anthers 6, bursting obliquely **Hæmatocarpus.**
  ♂ ♀ (?) petals 2; sepals 8; ♂ anthers 4 ....**Antitaxis.**

22. Parabæna Miers.

A climber with milky juice. *Flowers* in axillary dichotomous cymes. *Sepals* 6, subequal. *Petals* much smaller. ♂ *Anthers* 6, horizontal, surrounding the top of the staminal column; dehiscence transverse. ♀ *Staminodes* 6, cylindric. *Carpels* 3, styles subulate, recurved. *Fruit* drupaceous, ovoid, style-scar subterminal; endocarp subglobose, spinulose on the back, concave ventrally. *Seed* pitted, curved, ventrally concave; cotyledons ovate, leafy, spreading.

42. PARABÆNA SAGITTATA Miers; F. B. I. i. 96.

Chittagong.

A climber with milky juice, and cordate or sagittate leaves.

23. Anamirta Colebr.

A climbing shrub. *Flowers* panicled. *Sepals* 6 with 2 adpressed bracts. *Petals* 0. ♂ *Anthers* sessile on a stout column, 2-celled; dehiscence transverse. ♀ *Staminodes* 9, clavate, 1-seriate. *Carpels* 3 on a short gynophore; stigma subcapitate, reflexed. *Fruit* drupaceous on a 3-fid gynophore, obliquely ovoid, gibbous on the back, style-scar subbasal; endocarp woody. *Seed*

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globose, surrounding the intruded pericarp; albumen granular, horny; embryo curved, cotyledons thin.

43. Anamirta Cocculus W. & A.; F. B. I. i. 98; E. D. A. 1038. *Menispermum Cocculus* F. I. iii. 807.

Orissa.

A climbing shrub, with ovate, cordate leaves. *Vernac.* Kákmári.

24. Stephania Lour.

Climbing shrub; *leaves* usually peltate. *Flowers* in axillary umbellate cymes. ♂ *Sepals* 6–10, free, ovate or obovate. *Petals* 3–5, obovate, fleshy. *Anthers* 6, connate, encircling the top of the staminal column; dehiscence transverse. ♀ *Sepals* 3–5. *Petals* as in ♂. *Staminodes* 0. *Carpel* solitary, style 3–6 partite. *Fruit* drupe-like, glabrous; endocarp compressed, horseshoe-shaped, tubercled on the back, hollow and perforated on the sides. *Seed* almost annular; cotyledons long, slender.

44. Stephania hernandifolia Walp.; F. B. I. i. 103; E. D. S. 2794. *Cissampelos hernandifolia* F. I. iii. 842.

Common in hedges and thickets.

A slender climber with somewhat peltate leaves. *Beng.* A'kanádi, nimukha.

25. Cissampelos Linn.

Shrubs, suberect or climbing; *leaves* often peltate. ♂ *Flowers* cymose. *Sepals* 4, rarely 5–6, erose. *Petals* 4, connate in a 4-lobed cup. *Anthers* 4, connate, encircling the top of the staminal column; dehiscence transverse. ♀ *Flowers* racemose, crowded in axils of leafy bracts. *Sepals* 2, *petals* 0; or *sepal* 1 and *petal* 1, 2-nerved, adnate to the bracts. *Staminodes* 0. *Carpel* 1; style short, 3-fid or 3-toothed. *Fruit* drupaceous, ovoid, style-scar subbasal; endocarp horseshoe-shaped, compressed, tubercled on the back, sides hollowed. *Seed* curved; embryo slender with narrow cotyledons.

45. Cissampelos Pareira Linn.; F. B. I. i. 103; E. D. C. 1205. *C. Caapeba* F. I. iii. 842. *C. convolulacea* F. I. iii. 842.

Behar; W. Bengal; Chota Nagpur.

A climbing plant with generally peltate leaves; the female racemes with leafy imbricated bracts. *Santal.* Tejo Malla; *Beng.* Ekleja.

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26. Pycnarrhena Miers.

Shrubs, suberect or climbing. *Flowers* axillary, fascicled or panicled. ♂ *Sepals* 6 with 3 bracts, inner larger orbicular. *Petals* 6, small, lobed. *Stamens* 9, filaments very short; anthers subdidymous; dehiscence transverse. ♀ *Flower* unknown. *Fruit* drupe-like, broadly oblong, slightly gibbous; style-scar lateral; endocarp subreniform. *Seed* slightly concave ventrally; albumen 0; cotyledons oblong, very thick.

46. PYCNARRHENA PLENIFLORA Miers; F. B. I. i. 106.
    Chittagong.
    A climbing shrub. *Vernac.* Langadu (*Chittagong*).

27. Tinospora Miers.

Climbing shrubs. *Flowers* in axillary or terminal racemes or panicles. *Sepals* 6, 2-seriate, inner membranous larger. *Petals* 6, smaller. ♂ *Stamens* 6, filaments free, tips thickened; anther-cells adnate; dehiscence oblique. ♀ *Staminodes* 6, clavate. *Carpels* 3, stigmas forked. *Fruit* of 1–3 drupes convex above, flat below; style-scar subterminal; endocarp rugose, keeled on the back, concave below. *Seed* grooved ventrally or curved round the intruded endocarp; albumen ruminate below; cotyledons leafy.

Leaves orbicular-cordate somewhat 3-lobed, pubescent above, tomentose beneath; drupes orange-yellow.................................*tomentosa.*
Leaves cordate, glabrous, not lobed; drupes red ....*cordifolia.*

47. TINOSPORA TOMENTOSA Miers; F. B. I. i. 96. *Menispermum tomentosum* F. I. iii. 813.
    In hedges and thickets, rare.
    A climbing shrub. *Vernac.* Padmo-gulanchá.
48. TINOSPORA CORDIFOLIA Miers; F. B. I. i. 97; E. D. T. 470. *Menispermum cordifolium* F. I. iii. 811.
    In hedges and thickets everywhere, very common.
    An extensive climber. *Vernac.* Gulanchá.

28. Cocculus DC.

Shrubs, sarmentose or climbing, rarely suberect. *Flowers* panicled. *Sepals* 6, 2-seriate, outer smaller. *Petals* 6, smaller, usually auriculate. ♂ *Stamens* 6, embraced by the petals; anthers subglobose; dehiscence transverse. ♀ *Staminodes* 6 or 0. *Carpels*

3–6, styles usually cylindric. *Fruit* of laterally compressed drupes; endocarp horseshoe-shaped, keeled and tuberculate above, sides hollowed. *Seed* curved; albumen fleshy; embryo annular with linear cotyledons.

49. COCCULUS VILLOSUS DC.; F. B. I. i. 101; E. D. C. 1452.
Menispermum hirsutum F. I. iii. 814.
Behar; W. Bengal; Chota Nagpur: common in waste ground.
A tomentose climber. *Vernac.* Huyer.

29. **Tiliacora** Colebr.

Shrubs, wide-climbing. *Flowers* in axillary panicles, sometimes polygamous. *Sepals* 6, 2-seriate, outer much smaller. *Petals* 6, minute, cuneate. ♂ *Stamens* 6, filaments subcylindric; anthers adnate; dehiscence introrse, vertical. *Carpels* 3, rudimentary. ♀ *Carpels* 9–12; styles short subulate. *Fruit* of obovoid pedicelled subcompressed drupes with subbasal style-scar; endocarp thin, obscurely ribbed, laterally grooved. *Seed* hooked; albumen oily, ruminate; cotyledons linear, fleshy.

50. TILIACORA RACEMOSA Colebr.; F. B. I. i. 99; E. D. T. 456.
Menispermum polycarpum F. I. iii. 816.
In hedges and thickets everywhere, but especially in C. and E. Bengal.
A large glabrous climber. *Hind.* Bhaga-mushada, bhagaluta; *Beng.* Tiliacora.

30. **Hæmatocarpus** Miers.

A strong glabrous climber; *leaves* very coriaceous, 3-nerved. *Flowers* in axillary racemes or panicles. ♂ *Sepals* 9–12 with 3 bracts, large. *Petals* 6, minutely auriculate at the base. *Stamens* 6; anther-cells 2, discrete, connective hood-like dilated; dehiscence oblique. Rudimentary *carpels* 3, minute. ♀ *Sepals* 6, with 6 small basal bracts. *Petals* 6, greenish, opposite the sepals. *Carpels* 6; stigmas ligulate, reflexed. *Fruit* of 1–4 large ovoid-oblong drupes with blood-red juicy flesh, style-scar subbasal; endocarp coriaceous, oblong, adherent. *Seed* oblong; albumen 0; embryo very large, with thick semicylindric cotyledons.

51. HÆMATOCARPUS THOMSONI Miers; F. B. I. i. 106.
Chittagong.

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A strong glabrous climber with oblong leaves; the fruits like bunches of grapes, the endocarp blood-red.

31. **Antitaxis** Miers.

An erect shrub; *leaves* penninerved, coriaceous. *Flowers* in axillary fascicles. ♂ *Sepals* 8, in decussate pairs; outer small, the next obovate, the 4 inmost large imbricate orbicular. *Petals* 2, obovate. *Stamens* 4, filaments clavate; anthers 1-celled, subglobose; dehiscence transverse. ♀ *Flowers* unknown. *Fruit* of 1–3 subglobose drupes with ventral style-scar; endocarp thin, fragile, subreniform. *Seed* subglobose, ventrally concave; albumen 0; cotyledons oblong, slightly incurved, thick, semicylindric.

52. ANTITAXIS CALOCARPA Kurz.

Chittagong.

A shrub.

Order VI. BERBERIDEÆ.

Shrubs, armed or not, sometimes climbing, less often herbs; buds usually scaly. *Leaves* alternate, simple or compound; stipules rare (*Berberis* sometimes). *Flowers* regular, often globose, yellow or white, hermaphrodite or 1-sexual, in panicles or racemes or solitary. *Disk* 0. *Perianth* of similar sepals and petals, hypogynous, caducous, in 2 or more 2–3-, rarely 4-nate whorls, imbricate or with the sepals only valvate, very rarely 0. *Stamens* usually one opposite each petal; anthers erect, adnate; filaments free or connate; dehiscence longitudinal, extrorse or lateral, or by valves, revolute or ascending. *Carpels* 1 or 3, rarely 6–9, free, oblong, style 0 or short, stigma peltate or oblong or conical; ovules 2 or more, basal erect, or 2–many-seriate on the ventral suture, or many-seriate or scattered on the carpellary wall, anatropous with a ventral raphe rarely orthotropous. *Fruit* of berry-like fleshy, or dry indehiscent, or capsular dehiscent ripe carpels. *Seed* crustaceous, membranous or fleshy; albumen firmly fleshy; embryo minute or elongated.

32. **Berberis** Linn.

Shrubs with yellow wood; *leaves* pinnate or simple and then fascicled in the axils of 3–5-partite spines. *Flowers* regular, hermaphrodite, yellow, solitary fascicled or racemose. *Sepals* 6, 2-seriate, imbricate, with 2–3 adpressed bracts. *Petals* 6, 2-seriate, imbricate, with often 2 basal glands inside. *Stamens* 6, free; anther-cells opening by recurved valves. *Ovary* simple, stigma peltate, sessile or with a short style; ovules few, erect basal. *Fruit* berry-like, few-seeded.

53. BERBERIS ASIATICA Roxb.; F. B. I. i. 110; E. D. B. 453.
Chota Nagpur, on Parasnath, near the top.
A shrub.

Order VII. NYMPHÆACEÆ.

Herbs, perennial, aquatic; *leaves* usually floating radical, rarely on floating stems, often peltate, in bud involute. *Flowers* solitary on naked scapes. *Disk* fleshy and enveloping the carpels, sometimes also adnate to the tubular base of perianth, or 0. *Perianth* of many spirally imbricate segments, gradually passing from sepals to petals and petals to stamens or the whorls distinct with *sepals* 3–5, *petals* 3–5 or more, and *stamens* 6–many, all free hypogynous, or with the inner or all perigynous, less often epigynous, on the disk. *Stamens* with filaments continued as the connective; anthers erect with adnate cells; dehiscence longitudinal, introrse or extrorse. *Carpels* 3 or more in one whorl, free, or more often adnate to disk as a many-celled ovary, rarely (*Nelumbium*) discrete scattered on the top of the torus; styles as many as carpels with stigma decurrent or peltate; ovules many or few, scattered on the carpellary wall, or solitary pendulous from the apex of carpel, orthotropous or anatropous. *Fruit* of indehiscent ripe carpels, free or concrete as a pulpy or fleshy berry-like mass. *Seeds* naked or with an arillus; albumen floury with a cavity in which the embryo is partially immersed, or 0; embryo with thick cotyledons and usually a large plumule.

Carpels confluent with each other or with the disk; ovules many; seeds albuminous:—
  Sepals, petals, and stamens half-superior, inserted on the disk which is confluent with the carpels; plants unarmed........................**Nymphæa.**
  Sepals tubular below and confluent with the disk in which the carpels are enclosed, petals and stamens superior; plants armed with spines **Euryale.**
Carpels discrete, irregularly scattered, sunk in pits of the turbinate disk; sepals, petals, and stamens inferior; ovules 1–2; seeds without albumen; plants unarmed ....**Nelumbium.**

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33. **Nymphæa** Linn.

Large aquatic herbs with creeping rootstock. *Flowers* large expanded, floating on long radical scapes. *Sepals* 4, adnate to the base of the disk. *Petals* many-seriate, inner successively transformed into stamens, all adnate to disk. *Stamens* numerous; filaments petaloid; anthers small linear; dehiscence introrse. *Carpels* many, 1-seriate, sunk in the fleshy disk and forming with it a many-celled ovary crowned by the connate radiating furrowed stigmas; ovules numerous, anatropous. *Fruit* a spongy berry, ripening under water. *Seeds* very small, enclosed in a fleshy saccate arillus.

Leaves sharply sinuately toothed; sepals ribbed; anthers without appendages; stigmatic rays with clubbed appendages:—
  Flowers white ....*Lotus*.
  Flowers rose or red...*rubra*.
Leaves entire or obtusely sinuate; sepals many-veined but not ribbed; anthers with long appendages; stigmatic rays ending in short horns without appendages:—
  Flowers pale blue, 1–2 in. across ....*stellata*.
  Flowers darker blue, 4–5 in. across.......................*stellata* var. *major*.

54. Nymphæa Lotus Linn.; F. B. I. i. 114; E. D. N. 200. *N. esculenta* F. I. ii. 578.

Everywhere in ponds and ditches. *Beng.* Kambal. Two forms; one with glabrous, one with pubescent leaves.

55. Nymphæa rubra Roxb.; F. I. ii. 576.

Less common than the white-flowered plant though equally widespread. *Beng.* Rakto-kambal.

56. Nymphæa stellata Willd.; F. I. ii. 579; F. B. I. i. 114; E. D. N. 209.

Everywhere in ponds. *Beng.* Nil-padma.

56/2. Var. major Voigt. *N. cyanea* F. I. ii. 577.

Less common than the paler-flowered variety. *Beng.* Bara nil-padma.

34. **Euryale** Salisb.

Densely prickly aquatic herbs, with thick rootstock; *leaves* orbicular, corrugate. *Flowers* partially submerged. *Sepals* 4, erect, inserted on the edge of the thalamus above the carpels. *Petals* numerous, 3–5-seriate, shorter than the sepals.

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Stamens numerous, many-seriate, fascicled in bunches of 8; filaments linear. *Ovary* 8-celled, sunk in the dilated top of the thalamus; stigma discoid, depressed, concave; ovules few, parietal. *Fruit* a spongy berry, armed externally and crowned with the persistent sepals. *Seeds* 8–20, with a pulpy arillus.

57. EURYALE FEROX Salisb.; F. B. I. i. 115; E. D. E. 569. *Anneslia spinosa* F. I. ii. 573.

E. Bengal, in jhils, very common; Tippera; Chittagong; C. Bengal, rather rare.

A densely spiny aquatic herb. *Hind.* and *Beng.* Makana; *Uriya* Kanta-padma.

35. **Nelumbium** Willd.

A large erect aquatic herb with milky juice and stout creeping rootstock; *leaves* of young plants floating, of older raised above the water, peltate. *Flowers* large. *Sepals* 4–5, inserted on top of scape, passing into petals, caducous. *Petals* many-seriate, hypogynous, passing into stamens, caducous. *Stamens* numerous, many-seriate, hypogynous, caducous; anthers with a clavate appendage. *Carpels* many, each 1-celled, discrete, and sunk in the flat top of the obconic fleshy thalamus, fixed laterally in the cavities; style very short, exserted, stigma terminal dilated; ovules 1–2, pendulous. *Fruits* of ovoid ripe carpels, loose in the cavities of the enlarged spongy thalamus; pericarp long, smooth. *Seeds* filling the carpels, testa spongy, without albumen; cotyledons thick fleshy.

58. NELUMBIUM SPECIOSUM Willd.; F. I. ii. 647; F. B. I. i. 116; E. D. N. 39.

Everywhere in ponds.

A large water-plant; leaves peltate, floating in young plants. There are two forms, one with pink flowers, common; the other with white flowers, less usual. *Hind.* Kanwal; *Beng.* and *Uriya* Padma.

Order VIII. PAPAVERACEÆ.

Herbs, perennial or annual, rarely shrubs; juice milky or coloured. *Leaves* radical or alternate or both; stipules 0. *Flowers* often showy, regular, hermaphrodite, usually nodding in bud. *Disk* 0. *Sepals* 2, rarely 3, hypogynous, imbricate,

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very caducous. *Petals* 4, rarely 6, 2-seriate, very rarely more and spiral, hypogynous, large, crumpled, very caducous. *Stamens* many, several-seriate or spiral, hypogynous; filaments slender, innate; anthers erect; dehiscence longitudinal, lateral. *Carpels* 2 or more, united in a superior 1-celled ovary with parietal or more or less intruded placentas, or 2-celled (*Glaucium*) by a pseudo-replum, or 2- or more-celled from intrusion of the placentas as far as axis; style 0, or short, rarely long, stigmas always alternate with placentas though sometimes the adjacent halves of stigmas connate and apparently opposite the placentas; ovules many-seriate parietal, very rarely (*Bocconia*) solitary, anatropous with a lateral raphe. *Fruit* a capsule, completely or partially dehiscent by valves or pores. *Seeds* many, small, frequently caruncled; albumen fleshy or oily; embryo minute.

Sepals 2, petals 4; capsules globose; the stigmas sessile, radiating from its centre...**Papaver.**

Sepals 3, petals 6; capsules oblong; the stigmas plicate capitate, supported by a short distinct style ....**Argemone.**

36. **Papaver** Linn.

Annual or perennial herbs with milky juice; *leaves* lobed or cut. *Flowers* on long peduncles. *Sepals* 2, rarely 3, caducous. *Petals* 4, rarely 6, 2-seriate, caducous. *Stamens* numerous, hypogynous. *Carpels* united in a 1-celled ovary with 4 or more intruded placentas, sometimes several-celled by complete intrusion of placentas as far as axis; style 0, stigmas connate as a discoid or pyramidal star with rays composed of conjoint half-stigmas opposite each placenta. *Fruit* a short, usually truncate capsule, opening by short valves below the persistent stigma.

59. PAPAVER SOMNIFERUM Linn.; F. I. ii. 571; F. B. I. i. 117; E. D. P. 87.

Tirhut, and Behar, cultivated only.

A glabrous and glaucous annual, with milky juice; only white-flowered forms are cultivated in our area. *Beng.* Pasto.—The Opium Poppy.

37. **Argemone** Linn.

Annual herbs, erect, prickly; *leaves* variegated, lobed, lobes spinescent. *Flowers* in few-flowered cymes, with leafy bracts. *Sepals* 3, very rarely 4, caducous. *Petals* 6, very rarely 8, 2-seriate, caducous. *Stamens* numerous. *Carpels* united in a 1-celled ovary with 3–6 parietal placentas; style distinct, stigmas connate, lobes sub-radiating alternate with placentas, the folds at line of union of adjacent stigmas suberect. *Fruit* a longish, somewhat pointed capsule, opening about one-fourth of its length by triangular valves alternate with the placentas and opposite the stigmatic lobes.

60. ARGEMONE MEXICANA Linn.; F. I. ii. 571; F. B. I. i. 117; E. D. M. 1351.

Everywhere in waste places.

A prickly annual with yellow juice, yellow flowers and prickly leaves with white veins. *Beng.* Bara shil-kanta; *Santal.* Gokhula janum.

Order IX. FUMARIACEÆ.

Herbs, annual or perennial; juice watery. *Leaves* alternate or opposite, usually much divided; stipules 0. *Flowers* small, irregular, hermaphrodite, usually in racemes. *Disk* 0. *Sepals* 2, small, scale-like, caducous. *Petals* 4, 2-seriate, outer larger, one or both gibbous or spurred, inner always like each other but usually very unlike outer, narrower, erect with often cohering tips. *Stamens* rarely 4, free, opposite the petals, usually diadelphous, in 2 phalanges opposite the outer petals, each phalanx with a central 2-celled and 2 lateral 1-celled filaments that are free only at the apex; dehiscence longitudinal, lateral. *Carpels* 2, united in a superior 1-celled ovary with parietal nerviform placentas of which one may (*Fumaria*) be sterile; style short or long, stigma obtuse or lobed; ovules 2–many, amphitropous, 1–2-seriate on the placentas, very rarely solitary on each or on only one placenta. *Fruit* a 2-valved many- or few-seeded capsule, or indehiscent 1-seeded, rarely 2-seeded, and nut-like. *Seed* small, sometimes strophiolate; albumen fleshy; embryo minute.

38. **Fumaria** Linn.

Annual, rarely perennial, usually branched, often scandent herbs; *leaves* much divided, with narrow segments. *Flowers* small in terminal or leaf-opposed racemes, irregular, hermaphrodite. *Sepals* 2, small, scale-like, caducous. *Petals* 4, erect, 2-seriate, the 2 outer dissimilar, anterior concave posterior gibbous or spurred at the base, the two inner lateral similar, long-clawed, keeled, with usually cohering tips. *Stamens* diadelphous in antero-posterior bundles, each with a central 2-celled and two lateral 1-celled anthers. *Carpels* 2, connate in a 1-celled ovary with usually only 1 parietal fertile placenta; style filiform, stigma entire or slightly lobed; ovules normally 1 near base of fertile placenta. *Fruit* a small globose indehiscent 1-seeded nutlet.

61. FUMARIA PARVIFLORA Lamk.; F. I. iii. 217; F. B. I. i. 128; E. D. F. 723.

In fields and gardens, not uncommon.

A small branched annual weed with much-divided glaucous leaves. *Hind.* Pit-pápra; *Beng.* Ban-salpha.

Order X. CRUCIFERÆ.

Herbs, annual or perennial, rarely undershrubs; juice often pungent. *Leaves* radical in a rosette and cauline alternate; stipules 0. *Flowers* in racemes, rarely solitary axillary or on scapes. *Disk* with 4 glands opposite the sepals, or 0. *Sepals* 4, free, imbricate, hypogynous, the lateral pair opposite the placentas often the larger, saccate. *Petals* 4, free, hypogynous, set cross-wise. *Stamens* 6, rarely 2 or 1, or many; 2-seriate, outer whorl of 2 opposite the lateral sepals, inner of 4 with longer filaments in opposite pairs alternate with outer; anthers basifixed, oblong rarely linear or contorted, 2-, rarely 1-celled; dehiscence longitudinal, lateral. *Carpels* 2, united in a superior ovary 2-celled by a placental replum, or 1-celled, or with superimposed cells; style short or 0, stigma simple or with 2 lobes opposite the placentas; ovules 1–2, or many 2-seriate, on opposite sides of the replum, if present, on 2 parietal placentas, rarely solitary erect, campylotropous or amphitropous with raphe ventral. *Fruit* a 2-celled 2-valved capsule with deciduous valves and persistent replum and placentas, or transversely jointed or indehiscent. *Seeds* small, albumen 0; embryo with large cotyledons foliaceous in germination, radicle incumbent on the back of one or accumbent on edge of both cotyledons.

*Pods dehiscing:—[p. 218]

  †Pods narrow, long:—[p. 218]

    ‡Pods bearing seeds and dehiscing throughout their length; sepals not pouched at the base; cotyledons accumbent:—[p. 218]

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Pods almost cylindric; seeds globose, 2-seriate or irregularly 1-seriate; flowers yellow ....**Nasturtium.**
Pods flattened; seeds compressed, 1-seriate; flowers white **Cardamine.**

‡Pods with a seedless indehiscent beak projecting beyond the valves; sepals pouched at the base; cotyledons longitudinally folded or incumbent:—[p. 217]
Pods narrow cylindric or turgid, beak cylindric or conical; seeds 1-seriate; flowers yellow or yellow with green veins......**Brassica.**
Pods turgid, beak flattened; seeds 2-seriate; flowers lilac or yellow with lilac veins ....**Eruca.**

†Pods broad, short; sepals not pouched at base:—[p. 217]
Pods globose; seeds many, small, compressed; cotyledons accumbent; flowers (in our species) yellow..........................**Cochlearia.**
Pods flattened:—
Pods compressed from back, parallel to expanded replum; seeds few, compressed, cotyledons accumbent; flowers (in our species) white ....**Alyssum.**
Pods compressed laterally at right angles to the very narrow replum:—
Valves of the many-seeded pods not winged; cotyledons incumbent; flowers white ....**Capsella.**
Valves of the few-seeded pods winged, the tip of pod notched:—
Seeds in each cell solitary; cotyledons incumbent...**Lepidium.**
Seeds in each cell 4–6; cotyledons accumbent.........**Thlaspi.**

*Pods not dehiscing:—[p. 217]
Pods short globose, 2-celled, each cell 1-seeded; sepals spreading, not pouched at the base; white flowers and pods both very small **Senebiera.**
Pods elongated, terete, hollow or transversely septate; sepals erect, pouched at the base; flowers yellow white or lilac with purple veins, and pods large ....**Raphanus.**

39. **Nasturtium** R. Br.

Herbs, terrestrial or aquatic, usually branching, glabrous or hairy; *leaves* entire, lobed or pinnatifid. *Flowers* small, yellow, rarely white, sometimes bracteate. *Sepals* short, spreading, equal at the base. *Petals* short, narrowed at the base, scarcely clawed, or 0. *Stamens* 6, tetradynamous, or 4, or 2. *Capsule* long or short, subcylindric; valves faintly 1-nerved; replum thin, transparent; style short stoutish, or long slender, stigma entire or 2-lobed. *Seeds* small, turgid, 2-seriate or irregularly 1-seriate; cotyledons accumbent.

Pods short, broad, hardly longer than the pedicels ; bracts 0 ...*palustre*.
Pods long, narrow, at least twice as long as the pedicels :—
Flowers without bracts ....*indicum*.
Flowers with leafy bracts ....*indicum* var. *benghalense*.

62. NASTURTIUM PALUSTRE DC. ; F. B. I. i. 133.
Behar, rare ; N. Bengal, Maldah ; C. Bengal, 24-Pergunnahs ; never plentiful.
A small herb.

63. NASTURTIUM INDICUM DC.; F. B. I. i. 134. *Sinapis divaricata* F. I. iii. 123.
Everywhere, common.
A small herb.

63/2. Var. BENGHALENSE F. B. I. i. 134.
C. and E. Bengal, more common than the preceding ; Chittagong ; also N. Bengal, but rare.
A small herb. *Beng.* Bil-rái.

40. **Cardamine** Linn.

Herbs, often flaccid, annual or perennial, glabrous or slightly pubescent ; *leaves* entire, lobed or pinnatifid to -sect. *Flowers* white or purplish, rarely yellow. *Sepals* equal at the base. *Petals* distinctly clawed. *Capsule* narrow linear, compressed, tapering to both ends, midrib distinct, valves subelastic in dehiscence ; replum membranous ; stigma simple or 2-lobed. *Seeds* flattened, 1-seriate ; cotyledons accumbent.

64. CARDAMINE DEBILIS Don. *C. hirsuta* Linn. var. *sylvatica* F. B. I. i. 138 ; E. D. C. 549.
C. Bengal, not common.
A weed of the cold weather.

41. **Brassica** Linn.

Herbs, with often a woody rootstock, often biennial ; glabrous or hispid ; *leaves* large lyrate or pinnate, rarely entire. *Sepals* erect or spreading, lateral usually saccate at base. *Petals* distinctly clawed, yellow. *Capsules* elongate, terete or angular, with a seedless indehiscent beak projecting beyond the convex or slightly keeled 1–3-nerved valves ; replum membranous, in cultivated forms where valves are more than 2 sometimes partially or completely absorbed ; style beaked or ensiform ; stigma truncate or 2-lobed. *Seeds* globose ; cotyledons incumbent.

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Leaves of the stem all narrowed to their bases and not clasping the stem:—

Stems short till the flowering shoots appear; the leaves at stem-bases persisting to form a loose cabbage, stem-leaves not lyrately lobed, their margins fine-crenate ....*rugosa* var. *cuneifolia*.

Stems elongating from the commencement of growth; leaves at the base quickly withering, most of the stem-leaves lyrately lobed...*juncea*.

As preceding but smaller in all its parts and feral...*juncea* var. *agrestis*.

Leaves of the stem auriculate and stem-clasping:—

Leaves with hairs, at all events when young, and densely covered with a pale greyish bloom:—

Roots stout spindle-shaped; pods slender, beaded opposite the seeds *campestris* var. *oleifera*.

Roots slender tapering; pods stout, not beaded opposite the seeds *campestris* var. *Sarson*.

Leaves without hairs, green above, with a faint bloom beneath, less lobed and smaller than in the preceding ....*Napus* var. *dichotoma*.

65. Brassica rugosa Prain. *Sinapis rugosa* F. I. iii. 122.

A crop of the Himalaya from Kamaon eastward. *Vernac*. Badisha Lai (*Kamaon*), Pasai (*Nepal*), Palangi (*Nepal*).

The typical *S. rugosa* has irregularly deeply toothed leaves with a much thickened midrib; it does not occur in the plains.

65/2. Var. cuneifolia. *Sinapis cuneifolia* F. I. iii. 122.

A cold weather crop in N. Bengal. *Beng*. Lahi ság.

66. Brassica juncea Hook. f. & Thoms.; F. B. I. i. 157; E. D. B. 833. *Sinapis ramosa* F. I. iii. 119.

A cold weather crop in all the provinces except Chota Nagpur. *Hind*. Rái; *Beng*. Rái sarisha, chanchi, jhuni.

66/1. Var. agrestis. *Sinapis patens* F. I. iii. 124.

A weed appearing in C. and E. Bengal towards the end of the rains. *Beng*. Bil-rái, keel-rái.

67. Brassica campestris Linn. var. oleifera DC.; E. D. B. 808.

A cold weather crop in Chittagong only; apparently very near the Colza crop of Europe.

67/2. Var. Sarson. *B. campestris* subsp. *Napus* F. B. I. i. 156 (partly, not *B. Napus* Linn.). *Sinapis glauca* F. I. iii. 118; E. D. B. 817; 855. *B. trilocularis* F. B. I. i. 156. *Sinapis trilocularis* F. I. iii. 121. *B. quadrivalvis* F. B. I. i. 156.

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A cold weather crop in all the provinces. *Hind.* Sarson; *Beng.* Swet sarisha. The Sarson or Indian Colza crop.

There are two races of Sarson, viz., Natua with erect pods, and Ulti with pendent ones. Each race may be subdivided into two subraces, viz., that with 2-valved pods and a complete replum, and that with 3–4-valved pods and the replum incomplete or absent. The normal 2-valved Natua Sarson is, in part, *B. campestris* subsp. *Napus* of the F. B. I., and exactly *Sinapis glauca* of the F. I. The 3–4-valved Natua Sarson is *B. quadrivalvis* of the F. B. I.; it is not alluded to in the F. I. The normal 2-valved Ulti Sarson is neglected in both works; its occurrence is as a matter of fact rare, and its cultivation is confined to Northern Bengal and Eastern Behar. The 3–4-valved Ulti Sarson is *B. trilocularis* of the F. B. I., and *Sinapis trilocularis* of the F. I.

68. BRASSICA NAPUS Linn. var. DICHOTOMA. *Sinapis dichotoma* F. I. iii. 117. *B. campestris* subsp. *Napus* F. B. I. i. 156 partly; E. D. B. 822.

A cold weather crop in all the provinces. *Vernac.* Tori (*Tirhut, Behar*); Latni (*Chota Nagpur*); Sarisha (*C. Bengal*); Maghi (*E. and N. Bengal*). The Tori or Indian Rape crop; possibly the same as the Summer Rape of Europe.

42. **Eruca** Linn.

Herbs, erect and branching; *leaves* lyrate-pinnatifid. *Flowers* lilac with violet veins, or yellowish with lilac veins. *Sepals* erect, lateral saccate at the base. *Petals* clawed. *Capsules* ovoid, oblong, turgid, terete with a large flattened seedless beak, closely adpressed to axis; valves convex, 3-nerved; stigma simple. *Seeds* large, globose, 2-seriate; cotyledons incumbent, conduplicate.

69. ERUCA SATIVA Lamk.; F. B. I. i. 158. *Brassica erucoides* F. I. iii. 117.

In C. Bengal, occasionally; Behar, common.

A crop of the cold weather. *Hind.* Taranuri; *Beng.* Swet sarisha.

43. **Cochlearia** Linn.

Annual or perennial, glabrous, often fleshy herbs; *leaves* entire or pinnatipartite. *Flowers* white, rarely yellow or violet, corymbose or shortly racemose, rarely on solitary scapes. *Sepals* spreading, equal at the base. *Petals* shortly clawed. *Capsules*

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globose, ovoid or oblong, valves convex, turgid. *Seeds* 2-seriate, compressed; cotyledons accumbent.

70. COCHLEARIA FLAVA Ham.; F. B. I. i. 145.

Western Behar and Chota Nagpur, fairly common; C. Bengal, on the banks of the Ganges, very rare.

44. Alyssum Linn.

Herbs or small undershrubs, branched, often rigid, pubescent or hoary with stellate hairs or scales; *leaves* linear, entire. *Flowers* small, white or yellow, in bractless racemes. *Sepals* short, equal at the base. *Petals* with short claws, blade entire or 2-fid. *Filaments* often with tooth-like appendages. *Capsules* short, turgid or flattened parallel to replum, orbicular, elliptic, obovate, or oblong; replum membranous, perforated or entire; style short or long. *Seeds* few, flattened; cotyledons accumbent.

71. ALYSSUM MARITIMUM Linn.

In gardens, cultivated in the cold season, but occasionally coming up spontaneously on rubbish-heaps towards the end of the rains.

45. Capsella Linn.

Annual or perennial small branching herbs, with entire or pinnatifid radical leaves. *Flowers* small, white, racemose. *Sepals* spreading, equal at the base. *Petals* very short, hardly clawed. *Capsules* compressed laterally at right angles to the replum, obcordate or cuneate, oblong or ovate; valves convex; replum very narrow; style short. *Seeds* numerous, 2-seriate, margined; cotyledons incumbent.

72. CAPSELLA BURSA-PASTORIS Moench; F. B. I. i. 159; E. D. C. 443.

Tirhut; Behar; very rare in C. Bengal.

A weed of cultivation in the cold season. The "Shepherd's Purse."

46. Lepidium Linn.

Herbs, undershrubs or shrubs, diffuse or erect; *leaves* entire or divided. *Flowers* small, white, bractless. *Sepals* short, equal at the base. *Petals* sometimes only 2, or absent. *Stamens* 6, tetradynamous, or 4, sometimes abortive. *Capsules* ovate or oblong, rarely globose, usually orbicular, much compressed at right

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angles to replum, tip notched or entire; valves boat-shaped, winged, or keeled; replum narrow, membranous. *Seeds* solitary in each cell; cotyledons incumbent, sometimes divided.

73. Lepidium sativum Linn.; F. B. I. i. 159.

Cultivated in Tirhut, Behar and N. Bengal.

A small annual herb. *Vernac.* Hálim; aleveri.

47. **Thlaspi** Linn.

Herbs, annual or perennial; *leaves* entire or toothed, the upper often amplexicaul. *Flowers* small, white or pale pink, racemose. *Sepals* small, erect, equal at the base. *Petals* small. *Capsules* orbicular, obovate or obcordate, compressed at right angles to replum; valves boat-shaped, keeled, or winged; replum narrow, membranous; style short or long. *Seeds* 2 or more in each cell; cotyledons accumbent.

74. Thlaspi arvense Linn.; F. B. I. i. 162.

Behar, very rare.

A weed of cultivation in the cold season.

48. **Senebiera** DC.

Herbs, diffusely branched from the base, annual or biennial; *leaves* entire or pinnatisect. *Flowers* small, usually white, racemose. *Sepals* small, spreading, equal at the base. *Petals* small. *Stamens* 6, tetradynamous, or sometimes 4. *Fruits* indehiscent, small, didymous, laterally compressed; the valves subglobose, not separating, rugose or crested; stigma sessile. *Seeds* solitary in each chamber; cotyledons incumbent or the embryo spiral.

75. Senebiera pinnatifida DC.

A weed in garden ground and by roadsides, but apparently only in C. Bengal; is especially common at Mutlah.

A small diffuse herb; of recent introduction to India.

49. **Raphanus** Linn.

Herbs, glabrous or roughly hispid, annual or biennial; *leaves* lyrate-pinnatifid. *Flowers* large, yellow or white or lilac with purple veins, in long bractless racemes. *Sepals* erect, lateral pair saccate at base. *Petals* clawed. *Fruits* inhehiscent, elongate terete, thick, continuous or constricted at intervals with a long pointed tapering beak, the valves not separating; chamber within filled with pulp between the seeds or open. *Seeds* pendulous, globose; cotyledons induplicate.

76. Raphanus sativus Linn.; F. I. iii. 126; F. B. I. i. 166.

A cold weather crop.

An annual herb. *Beng.* Mula. The Radish.

Order XI. CAPPARIDEÆ.

Herbs or shrubs, erect or climbing, rarely trees. *Leaves* alternate, rarely opposite, simple or palmately compound; stipules herbaceous, setaceous, or spinous, or 0. *Flowers* regular or irregular, usually hermaphrodite, often showy, in terminal racemes or corymbs, or axillary in fascicles, or solitary. *Disk* tumid, lining the calyx-tube, or 0. *Sepals* 4 or 6 or 8, free or connate, 1–2-seriate, subequal or somewhat irregular, valvate or imbricate or outer only valvate or open. *Petals* 4, rarely 2 or absent, hypogynous or perigynous, imbricate or narrow and open in bud. *Stamens* 4 or more, hypogynous or perigynous; filaments filiform, free or connate below; anthers oblong, subdorsifixed; dehiscence longitudinal lateral. *Carpels* 2 or more, connate in a 1-locular ovary with 2–4 parietal placentas, sometimes 2–8-locular from septa arising from the placentas; sessile or at the apex of a short or long gynophore; style usually short or 0; stigma depressed or capitate; ovules many, 1–many-seriate on the placentas, rarely solitary, amphitropous or campylotropous. *Fruit* a 1-locular elongated capsule, or berry-like, rarely drupaceous and indehiscent, and globular or oblong or cylindric. *Seeds* reniform or angular; albumen 0 or very scanty; embryo rather large, bent or curved.

Herbs with slender capsular fruits:—
  Stamens arising from the disk; petals imbricate in bud; leaves simple with stamens 6, or digitately compound with stamens 12–many **Cleome.**
  Stamens arising from the gynophore; petals open in bud; leaves digitately compound with stamens 6 ....**Gynandropsis.**
Shrubs or trees with round or ovoid, berry-like, usually indehiscent fruits; stamens many, rarely definite:—
  Climbing shrubs with simple leaves and stipulary thorns; sepals 4, imbricate, free; disk 0...**Capparis.**
  Trees with digitately trifoliolate leaves, unarmed; sepals 4, open in bud, cohering below with a convex lobed disk ....**Cratæva.**

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50. **Cleome** Linn.

Herbs; *leaves* simple or digitately 3–9-foliolate. *Flowers* yellow, rose or purple, racemose. *Sepals* 4, spreading. *Petals* 4. *Stamens* 4 or more, directly attached to the thalamus. *Ovary* sessile; style short or 0; ovules many on 2 parietal placentas. *Fruit* an oblong or linear capsule with 2 valves that separate from the seed-bearing placentas. *Seeds* reniform.

Leaves simple; stamens 6; flowers dull purple.................*monophylla*.
Leaves compound; stamens 12 or more:—
  Stamens 12–20; flowers yellow; capsules and leaves softly viscid-pubescent ....*viscosa*.
  Stamens many; flowers rose-coloured; capsules glabrous, leaves glabrous or sparingly hairy ....*Chelidonii*.

77. CLEOME MONOPHYLLA Linn.; F. I. iii. 129; F. B. I. i. 168.

Behar; W. Bengal; Chota Nagpur.

A weed of fields and waste places. *Santal.* Harhara; kedar jawar.

78. CLEOME VISCOSA Linn.; F. I. iii. 128; F. B. I. i. 170; E. D. C. 1367.

In fields and waste places, everywhere.

A viscid herb. *Beng.* Hurhuria; *Hind.* Kanphuti.

79. CLEOME CHELIDONII Linn. f.; F. I. iii. 127; F. B. I. i. 170.

Behar, marshy places at the foot of the Rajmahal Hills, plentiful.

A herb.

51. **Gynandropsis** DC.

Annual glandular pubescent or glabrate herbs; *leaves* digitately 5–7-foliolate. *Flowers* purple, racemed. *Sepals* 4, spreading. *Petals* 4. *Stamens* 6, the filaments adnate below to the gynophore, free above. *Ovary* stalked; style short; ovules many on 2 parietal placentas. *Fruit* an oblong or linear capsule with 2 valves that separate from the seed-bearing placentas. *Seeds* reniform.

80. GYNANDROPSIS PENTAPHYLLA DC.; F. B. I. i. 171; E. D. C. 753. *Cleome pentaphylla* F. I. iii. 126.

In waste places, everywhere.

An annual herb with pale purplish flowers and 3-foliolate bracts. *Santal.* Seta kata arak; *Beng.* Sada hurhuria, ansarisha, arkahuli; *Hind.* Charota, karaila, húhíl.

52. **Capparis** Linn.

Trees or shrubs, erect, decumbent, or climbing, unarmed or with stipulary thorns; *leaves* simple, rarely 0. *Flowers* usually white, often showy. *Sepals* 4, free, 2-seriate, imbricate, or the outer pair valvate. *Petals* 4, sessile, imbricate. *Stamens* numerous, very rarely definite, inserted directly on the thalamus at base of gynophore. *Ovary* stipitate on a long gynophore, 1–4-celled; stigma sessile; ovules many on 2–6 parietal placentas. *Fruit* fleshy, indehiscent, rarely valvular dehiscent. *Seeds* many, imbedded in pulp; cotyledons convolute.

- Flowers few:—
  - Flowers supra-axillary, 2–4, the serially superposed pedicels of unequal length; leaves elliptic-oblong to broad-ovate, young shoots and sepals rusty pubescent .... *horrida.*
  - Flowers axillary, usually solitary:—
    - Leaves acute, broad-ovate to lanceolate, glabrous; fruit smooth; flowers 1–3 on a short shoot .... *zeylanica.*
    - Leaves orbicular, floccose with white pubescence; fruit ribbed, often dehiscing; flowers always solitary .... *spinosa* var. *leucophylla.*
- Flowers numerous, in umbellate corymbs; leaves glabrous:—
  - Corymbs simple, sessile or short-peduncled; stamens many; fruit as large as a pea .... *sepiaria.*
  - Corymbs arranged in large terminal panicles; stamens few (about 8); fruit as large as a cherry .... *floribunda.*

81. CAPPARIS HORRIDA Linn. f.; F. B. I. i. 178; E. D. C. 416.
C. zeylanica F. I. ii. 567 (not of Linn.).
In thickets and hedges, everywhere.
A climbing shrub. *Vernac.* Asaria, bagnai.

82. CAPPARIS ZEYLANICA Linn.; F. B. I. i. 174; E. D. C. 441.
C. acuminata F. I. ii. 566.
S.-W. Bengal and Orissa, on dry stony ground.
A rigid, wiry, much-branched shrub. *Beng.* Kalu kera.

83. CAPPARIS SPINOSA Linn. var. LEUCOPHYLLA Hook. f. & Thoms.; F. B. I. i. 173.
Tirhut, Bettiah.
A branched shrub, with prostrate or trailing branches. *Vernac.* Kabra.

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84. CAPPARIS SEPIARIA Linn.; F. I. ii. 568; F. B. I. i. 177; E. D. C. 427.

Hedges and thickets, general; Sundribuns, sea-face.

A rather extensive wiry climber. *Beng.* Kanta gur kamai.

85. CAPPARIS FLORIBUNDA Wight; F. B. I. i. 177.

Orissa.

A large woody climber.

53. Cratæva Linn.

Trees; *leaves* digitately 3-foliolate. *Flowers* large, yellow or purplish, polygamous. *Sepals* 4, cohering below with the lobed convex disk. *Petals* 4, long-clawed, open in bud. *Stamens* numerous; filaments adnate below to the base of the gynophore, free above. *Ovary* stipitate on a long gynophore, 1-celled; stigma sessile; ovules many on 2 parietal placentas. *Fruit* hard, indehiscent. *Seeds* imbedded in pulp.

Leaflets ovate-lanceolate, abruptly acuminate; fruit globose ...*religiosa.*
Leaflets ovate-lanceolate, gradually tapering; fruit ovoid *religiosa* var. *Nurvala.*

86. CRATÆVA RELIGIOSA Forst.; F. B. I. i. 172; E. D. C. 2039. *Capparis trifoliata* F. I. ii. 571.

Generally planted.

86/2. Var. NURVALA Hook. f. & Thoms.; F. B. I. i. 172; E. D. C. 2041.

As frequent as the preceding.

A stunted tree, standing long bare of leaves. Flowers large, from creamy-white to pale rose, with purple stamens. *Beng.* Tiktashak; *Hind.* Barun.

Order XII. VIOLACEÆ.

Herbs or shrubs. *Leaves* alternate, rarely opposite, entire or rarely pinnatisect; stipules leafy or small, often deciduous. *Flowers* regular or irregular, axillary, solitary or in simple or panicled cymes, rarely in racemes; pedicels usually 2-bracteolate. *Disk* 0. *Sepals* 5, persistent, equal or unequal, imbricate. *Petals* 5, hypogynous or slightly perigynous, irregular, less often subequal, usually contorted-imbricate. *Stamens* 5 perfect, hypogynous or slightly perigynous; filaments short or 0, connective usually wide and often produced; anthers erect, connivent or connate round the ovary, cells introrse; dehiscence longitudinal or rarely by apical pores. *Carpels* 3, rarely 4–5, connate in a 1-locular sessile superior ovary with parietal placentas; style simple; stigma capitate, truncate, or cup-like, entire or lobed; ovules many, rarely 1–2, on the parietal placentas, anatropous. *Fruit* a 3-valved, rarely 4–5-valved capsule, very rarely berry-like and indehiscent. *Seeds* small; albumen fleshy; embryo straight, axial.

54. Ionidium Vent.

Herbs or undershrubs; *leaves* alternate or sometimes opposite. *Flowers* axillary, orange, red or purple. *Sepals* 5, subequal, not produced at the base. *Petals* 5, lower largest clawed, saccate or spurred at the base. *Anthers* free or connate, 2 or 4 of them spurred on the back. *Ovary* ovoid; style clavate incurved, stigma oblique. *Fruit* a 3-valved, subglobose, few-seeded capsule. *Seeds* globose.

87. IONIDIUM SUFFRUTICOSUM Ging.; F. B. I. i. 185. *Viola suffruticosa* F. I. i. 649.

Everywhere in grassy places.

A small branching perennial, with rose-coloured flowers. *Beng.* Nunbora; *Hind.* Ratanpuras; *Santal.* Tandi sol, bir suraj mukhi.

Order XIII. BIXINEÆ.

Trees or shrubs. *Leaves* alternate, simple, usually toothed; stipules small, caducous, or 0. *Flowers* regular, hermaphrodite or 1-sexual; inflorescence various. *Disk* thickened, often glandular, or represented by glands on the torus. *Sepals* 4–5, rarely 2–3 or 6, imbricate or rarely subvalvate, occasionally connate and opening irregularly, deciduous. *Petals* as many as the sepals or 0, rarely many, imbricate or contorted. *Stamens* hypogynous or somewhat perigynous, usually many; anthers 2-celled; dehiscence longitudinal lateral, rarely apical porous. *Carpels* 2–many, connate in a 1-locular rarely more-locular ovary, very rarely carpel solitary, placentas parietal or somewhat intruded, linear or dilated; styles and stigmas as many as carpels, united or free; ovules 2–many on each placenta, amphitropous or anatropous. *Fruit* dry or fleshy, dehiscent with placentas on the middle of the valves, or indehiscent.

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Seeds usually few, arillate or with pulpy testa; albumen fleshy, rarely scanty; embryo straight or incurved, axial.

Sepals free; imbricate:—

Petals, if present, without any basal scale:—

Petals large, broad, contorted; anthers opening by pores; flowers large or medium, always hermaphrodite:—

Leaves deeply digitately lobed or divided; capsule smooth, 3–5-valved; seeds covered with cotton; flowers large, yellow, appearing before the leaves ....**Cochlospermum.**

Leaves entire; capsule softly prickly; seeds covered with dye-yielding pulp; flowers medium, white or pink, appearing with the leaves ....**Bixa.**

Petals 0; anthers opening by slits; flowers very small, usually diœcious:—

Ovary with 2–8 cells; branches almost always spiny; leaves (of our species) never more than twice as long as broad...**Flacourtia.**

Ovary 1-celled, with parietal placentas; branches rarely armed; leaves (of our species) thrice as long as broad...............**Xylosma.**

Petals small, with fleshy cuneate basal gland-like scales with ciliate edges; flowers rather small, usually diœcious............**Taraktogenos.**

Sepals connate in a valvately toothed or irregularly bursting cup; petals rather large, with basal ciliate scales; flowers conspicuous, diœcious; anthers opening longitudinally; ovary globose, 1-celled ...**Chaulmoogra.**

55. **Cochlospermum** Kunth.

Trees and shrubs, with yellow or reddish juice; *leaves* digitately lobed or divided. *Flowers* very large, yellow, hermaphrodite. *Sepals* 5, deciduous. *Petals* 5, large, contorted in bud. *Stamens* many, on a glandless disk; anther-cells with pores or short slits. *Ovary* globose, almost completely 3–5-celled; style simple, stigma lobed; ovules many on 3–5 intruded placentas. *Fruit* a 3–5-valved capsule with membranous endocarp. *Seeds* cochleate, testa hard, woolly; embryo curved.

88. COCHLOSPERMUM GOSSYPIUM DC.; F. B. I. i. 190; E. D. C. 1512. *Bombax gossypium* F. I. iii. 169.

W. Bengal; Behar; Chota Nagpur; Orissa: elsewhere planted.

A small tree, bare when flowering; flowers, very conspicuous, in hot season. *Beng.* Gabdi; *Santal.* Hopo; *Hind.* Kumbi; *Kol.* Galgal; *Uriya*, Konto palás. The Yellow Cotton-tree. The gum,—Katíra.

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56. **Bixa** Linn.

Trees, with simple *leaves* digitately nerved and slightly or not lobed. *Flowers* in terminal panicles, white or rose, hermaphrodite. *Sepals* 5, imbricate, deciduous. *Petals* 5, contorted in bud. *Stamens* numerous; anthers opening by terminal pores. *Ovary* 1-celled, placentas 2 parietal; style slender curved; ovules many. *Fruit* a 2-valved loculicidal capsule, the placentas in the centre of the valves. *Seeds* numerous, with thick funicle and dye-yielding pulpy testa; embryo large, with scanty fleshy albumen.

89. BIXA ORELLANA Linn.; F. I. ii. 581; F. B. I. i. 190; E. D. B. 523.

Cultivated everywhere, but in Bengal proper very generally wild in village jungles.

A small, evergreen American tree or large bush grown for the dye yielded by the pulpy testa. The cultivated form has often rose flowers; the flowers of plants that have run wild are almost always white. *Vernac.* Latkan (*generally*); Kong kuombi (*Santal.*); Powasi (*Chittagong*); Gúlbas (*Orissa*). The Anatto.

57. **Flacourtia** Commers.

Trees or shrubs, often spiny; *leaves* simple, toothed or crenate. *Flowers* small, usually diœcious, rarely hermaphrodite. *Sepals* 4–5, small, imbricate. *Petals* 0. *Stamens* numerous; anthers versatile. *Ovary* 2–8-celled, on a glandular disk; styles 2 or more, stigmas notched or 2-lobed; ovules usually in pairs on each placenta. *Fruit* indehiscent with a hard endocarp; cells 1-seeded. *Seeds* obovoid with leathery testa; cotyledons orbicular.

Leaves oblong or oblong-lanceolate with acuminate apices, twice as long as broad; spines compound; fruits about the size of grapes...*Cataphracta.*
Leaves ovate, obovate, oblong or elliptic with blunt apices, less than twice as long as broad; spines simple; fruits about the size of currants:—
  Thorns scattered, naked; styles usually united, lobes of stigma 5–7; berry when dried 5–7-angled; seeds 8–10:—
    Leaves glabrous above, glabrous or only hairy on the midrib beneath ....*Ramontchi* var. *sapida.*
    Leaves often hairy above, always hairy, sometimes velvety beneath *Ramontchi* var. *occidentalis.*
  Thorns numerous, almost always bearing leaves and flowers; styles usually free, lobes of stigma 3–4; berry when dried 3–4-angled; seeds 5–6 ....*sepiaria.*

90. Flacourtia Cataphracta Roxb.; F. I. iii. 834; F. B. I. i. 193; E. D. F. 603.

N. Bengal; E. Bengal; Tippera; Chittagong.

A small tree. *Beng.* Paniálá; *Hind.* Talispatri, paniaonla.

91. Flacourtia Ramontchi L'Herit. var. sapida F. B. I. i. 193; E. D. F. 615. *F. sapida* F. I. iii. 835.

Behar; Chota Nagpur, eastern districts; W. Bengal, common; C. Bengal, rather rare; Orissa.

A rambling shrub. *Beng.* Benchi, katai, tambat; *Santal.* Serali; *Uriya*, Baincho; *Hind.* Bilangoa, kanjú, bench.

91/2. Var. occidentalis Hook. f. & Thoms.; F. B. I. i. 193.

Western Behar; Western Chota Nagpur.

A rambling shrub. *Santal.* Merli; *Kol.* Merlec.

92. Flacourtia sepiaria Roxb.; F. I. iii. 835; F. B. I. i. 194; E. D. F. 624.

C. and E. Bengal, common; also Sundribuns.

A low, rather compact spiny shrub. *Beng.* Benchi.

58. Xylosma Forst.

Trees or shrubs; *leaves* simple, usually serrate. *Flowers* small, diœcious. *Sepals* 4–5, small, imbricate. *Petals* 0. *Stamens* numerous; anthers versatile. *Ovary* on a glandular disk, 1-celled with 2, rarely 3–6 parietal placentas; style very short, usually entire, stigma capitate. *Fruit* a globose 2–8-seeded berry. *Seeds* obovoid with leathery testa.

93. Xylosma longifolium Clos.; F. B. I. i. 194; E. D. X. 21.

Chota Nagpur.

A large shrub or small tree, flowers deliciously scented. *Vernac.* Dandal, katari, khandara.

59. Taraktogenos Hassk.

Trees; *leaves* entire, alternate; stipules minute, fugacious. *Flowers* in more or less dense, short, few-flowered, axillary cymes, a very few sometimes hermaphrodite on the functional male trees, but the majority staminate only. ♂ *Sepals* 4 in decussate pairs, much imbricate, round, concave. *Petals* 8 in 2 rows, smaller than the sepals, imbricate, each with a basal gland; glands less than half as large as petals, fleshy, cuneate, often fringed, ridged and pitted. *Stamens* 20–32, anthers deeply cordate. ⚥ and ♀ like males in structure. *Sepals*, however, often only 3. *Petals* often only 6. *Stamens*, when present, about 16. *Carpels* 4, connate in a 1-celled, elongate-ovoid, often sulcate ovary, divided above into 4 oblong, divergent, reflexed lobes, stigmatic on their inner faces; placentas 4, parietal; ovules many on each placenta. *Fruit* large, globose or ovoid, with a hard fibrous or woody rind. *Seeds* many with a thick firm testa; albumen copious, firm; embryo central straight, with large, cordate, foliaceous, 3-nerved cotyledons.

94. TARAKTOGENOS KURZII King; E. D. G. 762.

Tippera; Chittagong.

A tree 40–50 feet high; yields the Chaulmoogra seeds and Chaulmoogra oil of commerce. *Vernac.* Chaulmoogra (*Chittagong*).

60. Chaulmoogra Roxb.

A tree with large, entire, glabrous leaves. *Flowers* fascicled, axillary or on the stem and large branches below the leaves, diœcious. *Sepals* connate in a cup-shaped, valvately 5-toothed or irregularly opening persistent calyx. *Petals* 5, each with a basal ciliate scale. ♂ *Stamens* numerous; anthers basifixed, linear. *Ovary* 0. ♀ *Staminodes* 10–15, villous. *Ovary* globose 1-celled; styles 5; stigmas large, cordate; ovules many, on 5 parietal placentas. *Fruit* large globular, berry-like, with a rough, hard, woody rind. *Seeds* obovoid, imbedded in pulp, with tough, thick testa; albumen oily; cotyledons large, flat, fleshy, reniform, usually more or less excentric with radicle generally horizontal.

95. CHAULMOOGRA ODORATA Roxb.; F. I. iii. 835. *Gynocardia odorata* F. B. I. i. 195; E. D. G. 761.

Chittagong.

A large tree; long supposed to be the source of the well-known Chaulmoogra seeds, an idea now known to be erroneous. *Vernac.* Chaulmoogra (*Silhet*).

Order XIV. POLYGALACEÆ.

Herbs or shrubs, sometimes scandent, or trees. *Leaves* alternate or subopposite, rarely whorled, simple, entire; occasionally reduced and scale-like or 0; stipules 0. *Flowers* irregular, hermaphrodite; pedicel jointed, bracteate and 2-bracteolate. *Disk* 0 or small, annular. *Sepals* 5, 2 inner wing-like, petaloid, large, imbricate. *Petals* 5 or 3, free or connate, unequal, lowest usually keel-like. *Stamens* 8, rarely 5 or 4, hypogynous; filaments connate in a cleft sheath, less often free, usually adnate to petals; anthers erect, cupular or subtubular; dehiscence apical by pores, less often by an introrse opening, rarely longitudinal introrse. *Carpels* usually 2, rarely 3–5, united in a generally 2-locular or occasionally by abortion 1-locular, less often 3–5-locular superior ovary; style simple, curved stigma usually capitate; ovules 1, rarely more in each cell, anatropous. *Fruit* generally a 2-celled, 2-seeded loculicidal capsule; sometimes indehiscent 1-seeded, rarely of 3 indehiscent carpels. *Seeds* pendulous, usually strophiolate; albumen fleshy, rarely scanty or 0; embryo straight, axial.

Herbs or undershrubs; fruit a compressed, loculicidally 2-celled capsule; seeds 2, albuminous; petals gamophyllous; stamens monadelphous:—

> Sepals 5, the two inner hardly larger than the others; petals 3, lateral pair united to keel, upper pair absent; stamens 4–5 ....**Salomonia.**
>
> Sepals 5, the two inner much larger than the others; petals 3, lateral pair united to keel, upper 0, or represented by scales; stamens 8; plants sometimes woody at the base ....**Polygala.**

Shrubs or trees; fruit indehiscent 1-celled; seeds solitary, without albumen; petals free, stamens 8:—

> Sepals 5, the two inner much larger than the others; petals 3, lateral pair not united to keel, upper pair represented by scales; stamens monadelphous; fruit with a samaroid wing; climbers......**Securidaca.**
>
> Sepals 5, all subequal; petals 5, subequal, free; stamens 8, free (2 hypogynous, 6 epipetalous); fruit not winged; erect trees **Xanthophyllum**

61. Salomonia Lour.

Annual herbs, leafy and diffuse, or leafless and parasitic. *Flowers* minute, in dense terminal spikes. *Sepals* subequal, the 2 inner only slightly larger than the others. *Petals* 3, adnate at the base to the staminal tube, the lowest keeled and somewhat hooded. *Stamens* 4–5, the filaments in their lower half connate in a sheath; anthers with porous dehiscence. *Ovary* 2-locular, with one pendulous ovule in each cell. *Fruit* a laterally compressed capsule, 2-celled, opening loculicidally, margins toothed. *Seeds* albuminous, with a faint strophiole or naked.

96. SALOMONIA OBLONGIFOLIA DC.; F. B. I. i. 207.

> W. Bengal; Chota Nagpur; Behar; Tirhut; N. Bengal; always rather scarce.
>
> A slender annual with small leaves and strict, angular stems.

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62. **Polygala** Linn.

Herbs, rarely shrubs, with alternate leaves. *Sepals* usually persistent, the two inner considerably larger than the others and petaloid. *Petals* 3, connate at their bases with the staminal sheath, the lower keeled and generally crested. *Stamens* 8, the filaments connate for their lower half in a split sheath; anthers with dehiscence porous. *Ovary* 2-locular; ovules in each cell solitary, pendulous. *Fruit* a 2-celled, loculicidal capsule, with one seed in each cell. *Seeds* albuminous, almost always strophiolate.

Calyx deciduous; keel petal not crested; bracts caducous; strophiole of seed with two small appendages; flowers very small, yellow; leaves large, membranous (1–2 in. long)............................*triphylla* var. *glaucescens*.

Calyx persistent; keel petal crested; bracts persisting till the flowers open; leaves herbaceous:—

Racemes axillary or extra-axillary; bracts minute:—

Racemes dense-flowered, shorter than the leaves:—

Stems woody below; wings obovate, membranous, petaloid, with rounded tips, twice as long as capsule; capsule broader than long, notched, ciliate; seeds hairy, strophiole with two small appendages; leaves large (1·5–2 in. long) ....*crotalarioides*.

Stems herbaceous; wings not much longer than capsule:—

Wings obliquely oblong, membranous, petaloid, hairy; capsule ovate, notched, hairy; seeds densely silky, strophiole galeate, without appendages ....*erioptera*.

Wings very oblique, acute, herbaceous, glabrous; capsule suborbicular, notched, glabrous except the ciliate margin; seeds sparsely hairy, strophiole with 3 very short appendages *chinensis*.

Racemes lax-flowered, longer than the leaves; wings very oblique, herbaceous; capsules didymous narrowed upwards, narrowly winged, glabrous; seeds villous, strophiole galeate with 3 appendages ....*elongata*.

Racemes terminal, dense-flowered; bracts twice as long as buds; wings petaloid, membranous, glabrous, obovate, much narrowed below, nearly twice as long as the suborbicular winged capsule ....*leptalea*.

97. POLYGALA TRIPHYLLA Ham. var. GLAUCESCENS Hook. f. & Thoms.; F. B. I. i. 201.

Chota Nagpur, on most of the higher hills.

A weak erect or ascending herb with slender stems.

98. POLYGALA CROTALARIOIDES Ham.; F. B. I. i. 201; E. D. P. 1065.

Behar; Chota Nagpur: rather uncommon.

A small, much-branched undershrub. *Santal.* Lil kathi.

99. Polygala erioptera DC.; F. B. I. i. 203.

Behar and Chota Nagpur, frequent.

An annual herb, usually decumbent and diffuse.

100. Polygala chinensis Linn.; F. B. I. i. 204; E. D. p. 1062. *P. arvensis* F. I. iii. 218.

Common everywhere in pastures and on roadsides.

An annual herb, usually decumbent and diffuse. *Beng.* and *Hind.* Meradu.

101. Polygala elongata Klein; F. B. I. i. 203.

Western Behar.

An erect annual. The Behar plant is the form with linear-oblong, obtuse leaves.

102. Polygala leptalea DC.; F. B. I. i. 202.

Chota Nagpur; Behar; Tirhut; N. Bengal.

An erect branching perennial, with slender angled stems.

63. **Securidaca** Linn.

Shrubs, usually scandent; *leaves* alternate, simple, entire. *Flowers* in terminal or axillary simple or panicled racemes. *Sepals* deciduous, the two inner larger wing-like and petaloid. *Petals* 3, lateral pair not united to keel, the upper represented by scales, the lowest keeled, galeate and crested. *Stamens* 8, filaments connate; anthers 2-celled, dehiscence obliquely porous. *Ovary* 1-locular; ovule solitary. *Fruit* a 1-celled, 1-seeded samara, with broad coriaceous wing. *Seeds* without albumen and without a strophiole.

103. Securidaca tavoyana Wall.; F. B. I. i. 208.

Tippera; Chittagong.

A large woody scandent shrub.

64. **Xanthophyllum** Roxb.

Trees, with large, alternate, coriaceous, pale-green leaves. *Flowers* in panicles. *Sepals* 5, nearly equal. *Petals* 4 or 5, nearly equal, the lowest keeled but not crested. *Stamens* 8, 2 hypogynous, filaments free, 6 adnate to the base of the petals. *Ovary* stipitate, 1-locular; style curved; ovules several. *Fruit* 1-celled, 1-seeded, indehiscent. *Seeds* without albumen and without a strophiole.

104. Xanthophyllum flavescens Roxb.: F. I. ii. 222; F. B. I. i. 209; E. D. x. 8.

Chittagong.

A timber tree; wood very hard and durable. *Beng.* Ajensak, gandi.

Order XV. CARYOPHYLLACEÆ.

Herbs, rarely shrubby at the base, stems and opposite branches with usually thickened nodes. *Leaves* opposite, entire or serrulate, often connate; stipules small scarious, or 0. *Flowers* hermaphrodite, rarely 1-sexual, solitary terminal, or in cymes. *Disk* small, annular or elongated, or represented by glands. *Sepals* 4 or 5, connate or free, imbricate. *Petals* 4–5, rarely 0, hypogynous, rarely perigynous on the disk. *Stamens* 8 or 10, rarely fewer, inserted with petals; filaments filiform; anthers 2-celled; dehiscence longitudinal lateral. *Carpels* 2–5, united as a 1-locular, rarely imperfectly 2–5-locular ovary; styles 2–5 free, or style single 2–5-lobed above, styles or style-lobes stigmatic on inner face; ovules 2–many, on slender basal funicles that may be free or united as an axial column, amphitropous. *Fruit* a membranous or crustaceous capsule opening by valves or teeth as many or twice as many as styles, rarely fleshy and indehiscent or bursting irregularly. *Seeds* few or many, rarely solitary, reniform, globose, obovoid or flattened; albumen mealy rarely fleshy; embryo usually excentric curved, sometimes nearly straight in flattened seeds.

Calyx gamosepalous, 5-toothed; petals clawed and inserted with the stamens on a gynophore; capsule shortly 4-valved; styles 2 free; stipules 0……………………………………………………………**Saponaria.**

Calyx of 4–5 free sepals; petals subsessile and inserted with the stamens on an annular disk:—

Styles 3–5, free:—

Stipules 0; petals 2-fid if present………………………………… **Stellaria.**

Stipules scarious; petals entire ………………………………… **Spergula.**

Styles 3, combined; stipules scarious:—

Sepals herbaceous; petals 2–6-fid; style 3-fid; leaves ovate-cordate, opposite, flat, petioled ………………………………………**Drymaria.**

Sepals scarious; leaves narrow, opposite and in axillary fascicles, sessile:—

Sepals keeled; petals entire; style 3-fid………………**Polycarpon.**

Sepals not keeled; petals entire, 2-dentate or erose; styles united throughout; stigma 3-toothed…………………………**Polycarpæa.**

65. **Saponaria** Linn.

Herbs, annual or perennial; *leaves* flat. *Flowers* in dichotomous cymes. *Calyx* more or less tubular, ovoid or oblong, 5-toothed; nerves obscure. *Petals* 5, clawed, limb entire or notched, with or without a basal scale. *Stamens* 10. *Disk* small or elongated into a gynophore. *Ovary* 1-celled or imperfectly 2–3-celled; styles 2, rarely 3; ovules numerous. *Fruit* an ovoid or oblong capsule, rarely subglobose, 4-toothed in dehiscing. *Seeds* reniform or subglobose; embryo annular.

105. SAPONARIA VACCARIA Linn.; F. B. I. i. 217; E. D. S. 850. *S. perfoliata* F. I. ii. 445.

In fields of grain in Tirhut and Behar, common; C. Bengal, occasional only.

A cold weather weed. *Beng.* Sabuni; *Hind.* Musna.

66. **Stellaria** Linn.

Herbs, annual or perennial, erect or prostrate; *leaves* usually flat; stipules 0. *Flowers* in dichotomous cymes, or occasionally terminal solitary, white. *Sepals* 5, rarely 4, free or connate at the base. *Petals* 5, rarely 4, 2-fid or 2-partite, occasionally 0. *Stamens* 10, rarely fewer, hypogynous or perigynous. *Disk* annular or divided into glands. *Ovary* 1-locular, rarely 3-locular; styles 3 or rarely 2–5; ovules usually numerous. *Fruit* a short capsule, splitting from below the middle to the base into as many entire or 2-fid valves as there are styles. *Seeds* compressed, tubercled, granulate or nearly smooth; embryo annular.

106. STELLARIA MEDIA Linn.; F. B. I. i. 230; E. D. S. 2789.

C. Bengal, occasional in waste ground or gardens, but only near Calcutta, in the cold weather.

A variable weed.

67. **Spergula** Linn.

Herbs, annual or perennial, with dichotomous or fascicled branches; *leaves* opposite, with frequently axillary leafy buds whence leaves become pseudo-verticillate; stipules small, scarious. *Flowers* in peduncled paniculate cymes. *Sepals* 5. *Petals* 5, entire. *Stamens* 10 or 5, rarely fewer, rising from the perigynous disk. *Ovary* 1-locular; styles 3 or 5; ovules numerous. *Fruit* a capsule, with 3 or 5 entire valves. *Seeds* compressed, winged or marginate.

Green, leaves linear, semi-terete grooved beneath; petals obtuse; seeds keeled or narrowly winged, papillose ....*arvensis.*
Glaucous, leaves linear-subulate, terete not grooved beneath; petals acute; seeds smooth compressed, broadly winged ....*pentandra.*

107. SPERGULA ARVENSIS Linn.; F. B. I. i. 243; E. D. S. 2512.
Behar; Chota Nagpur; W. Bengal.
A cold weather weed.

108. SPERGULA PENTANDRA Linn.; F. B. I. i. 243. *Arenaria flaccida* F. I. ii. 447.
Behar; Chota Nagpur; W. Bengal; also C. Bengal, near Calcutta, but rare.
A cold weather weed.

68. **Drymaria** Willd.

Herbs, diffuse or suberect, much dichotomously branched; *leaves* flat; stipules small, often fugacious. *Flowers* solitary or cymose, terminal or axillary. *Sepals* 5, herbaceous. *Petals* 5, 2–6-fid. *Stamens* 5, rarely fewer, slightly perigynous. *Ovary* 1-locular; style 3-fid; ovules few or numerous. *Fruit* a 3-valved capsule. *Seeds* globose, reniform, or compressed; embryo curved.

109. DRYMARIA CORDATA Willd.; F. B. I. i. 244. *Cerastium cordifolium* F. I. ii. 458.
Chota Nagpur, on Parasnath; N. Bengal.
A diffuse weed.

69. **Polycarpon** Linn.

Herbs, glabrous or pubescent, diffusely dichotomously branched; *leaves* flat, opposite, with axillary leafy buds whence leaves become pseudo-verticillate; stipules scarious. *Flowers* small, in crowded many-flowered cymes with scarious bracts. *Sepals* 5, keeled. *Petals* 5, small, hyaline, entire or toothed. *Stamens* 3–5. *Ovary* 1-locular; style short 3-fid; ovules numerous. *Fruit* a 3-valved capsule. *Seeds* ovoid; embryo incurved or nearly straight.

110. POLYCARPON LŒFLINGIÆ Benth. & Hook. f.; F. B. I. i. 245. *Lœflingia indica* F. I. i. 165.
In fields and waste places, everywhere.
An erect or diffuse weed. *Hind.* Sureta; *Beng.* Ghima.

70. **Polycarpæa** Lamk.

Herbs, annual or perennial, usually erect; *leaves* flat, opposite, with axillary leafy buds whence leaves become pseudo-verticillate;

stipules scarious. *Flowers* small, numerous, in open or congested or subcapitate cymes. *Sepals* 5, scarious throughout and often coloured, or scarious at the edges and elsewhere herbaceous. *Petals* 5, with entire, 2-toothed or erose margins. *Stamens* 5, subperigynous, free or connate in a tube and further adnate to petals. *Ovary* 1-locular; style slender 3-fid or 3-toothed; ovules numerous. *Fruit* a 3-valved capsule. *Seeds* obovoid or compressed; embryo curved, rarely straight.

111. POLYCARPÆA CORYMOSA Lamk.; F. B. I. i.; E. D. P. 1060.
Celosia corymbosa F. I. i. 681.

In fields and waste places throughout Behar and Chota Nagpur; on sandy river-banks in N. and E. Bengal.

An erect or decumbent herb. *Santal.* Janhe nanjom.

Order XVI. PORTULACACEÆ.

Herbs, rarely undershrubs. *Leaves* opposite or alternate, entire; stipules scarious or bristly, occasionally 0. *Flowers* regular, hermaphrodite. *Disk* 0, but ovary sometimes (*Portulaca*) partially sunk in the torus. *Sepals* fewer than petals, usually 2, imbricate. *Petals* 4–5, rarely more, hypogynous or perigynous, free or united below, fugacious. *Stamens* 4–many, inserted with petals and sometimes adnate to their base; filaments filiform; anthers 2-celled, cells parallel; dehiscence longitudinal, lateral. *Carpels* united as a free or half-inferior 1-locular ovary; style simple below, 3- or more-, rarely 2-fid above, the branches stigmatic within; ovules 2–many, on slender basal funicles that may be free or united in an axial column, amphitropous. *Fruit* a membranous capsule opening transversely or by as many valves as there are style-arms, or, occasionally, indehiscent. *Seeds* 1–many, compressed; albumen mealy; embryo excentric, curved.

Flowers terminal, solitary or clustered, surrounded by a whorl of leaves; calyx-segments united below in a persistent tube adnate to lower half of ovary, the upper free teeth deciduous ....**Portulaca.**

Flowers laxly paniculate; sepals free, entirely deciduous; ovary free **Talinum.**

71. Portulaca Linn.

Herbs, annual or perennial, diffuse, usually succulent; *leaves* with scarious or bristly nodal stipular appendages; occasionally stipules 0. *Flowers* terminal, solitary or clustered, surrounded by a whorl of leaves. *Sepals* 2, connate below, the free portion deciduous. *Petals* 4–6, perigynous or epigynous. *Stamens* 5 or more. *Ovary* half-superior; style 3–8-fid; ovules numerous. *Fruit* a crustaceous, circumscissile capsule. *Seeds* many, reniform.

Leaves flat; seeds brown; stamens 8–12; root slender:—
  Leaves ·4–1·2 in. long, cuneate-oblong; nodes not pilose; flowers in clusters of 3–5, small, yellow; petals 5; style 3–8-fid ....*oleracea.*
  Leaves ·2–·3 in. long, ovate-oblong to ovate-lanceolate; nodes pilose; flowers solitary, small, yellow, surrounded by a whorl of 4 leaves; petals 4; style 3–4-fid ....*quadrifida.*
Leaves terete, linear, ·5–·6 in. long; seeds black; stamens 20–many; root tuberous; flowers in terminal clusters, yellow, surrounded by a whorl of 8 leaves and by tufted hairs..................................*tuberosa.*

112. PORTULACA OLERACEA Linn.; F. I. ii. 463; F. B. I. i. 246; E. D. P. 1179.

Everywhere common in waste ground.

An annual prostrate succulent herb. *Vernac.* Bara laniya.

113. PORTULACA QUADRIFIDA Linn.; F. B. I. i. 247; E. D. P. 1187. *P. meridiana* F. I. ii. 463.

Everywhere, very common by roadsides and in waste places.

A small diffuse prostrate annual. *Vernac.* Chota laniya.

114. PORTULACA TUBEROSA Roxb.; F. I. ii. 464; F. B. I. i. 247; E. D. P. 1191.

Behar, Monghyr.

A perennial with somewhat fusiform tuberous stock. *Vernac.* Laniya.

72. **Talinum** Adans.

Herbs or undershrubs, with succulent stems and flat leaves; stipules 0. *Flowers* racemose or panicled. *Sepals* 2, herbaceous, ovate, deciduous or subpersistent. *Petals* 5, hypogynous. *Stamens* 5 or more. *Ovary* superior; style 3-fid; ovules many. *Fruit* a globose or ovoid 2–3-valved capsule. *Seeds* subglobose or compressed, numerous, strophiolate.

115. TALINUM PATENS Willd. *T. cuneifolium* F. I. ii. 465.

C. Bengal; becoming somewhat common in the neighbourhood of Calcutta.

An American introduced weed. This, which is the *T. cuneifolium* of the F. I., is not the *T. cuneifolium* of the F. B. I. The latter is a species indigenous in India; it does not, however, occur in Bengal.

Order XVII. TAMARISCINEÆ.

Shrubs or small trees. *Leaves* alternate, minute, often scale-like, imbricate, sometimes sheathing, occasionally fleshy; stipules 0. *Flowers* regular, hermaphrodite, rarely 1-sexual, solitary or in simple or panicled axillary spikes. *Disk* of 10 hypogynous or subperigynous glands. *Sepals* 5, rarely 4, imbricate. *Petals* 5, rarely 4, free or connate below. *Stamens* 4–5, or 8–10, rarely more, inserted on the disk; filaments free or connate below; anthers 2-celled versatile, often apiculate; dehiscence longitudinal lateral. *Carpels* 3–5, united as a free 1-locular or imperfectly 3–5-locular ovary with 3–5 septiform placentas free or somewhat connate at the centre, or somewhat united with ovarian wall at their peripheral margin, sometimes extending to top of ovarian chamber; styles free or connate with apical stigmas, or stigmas sessile, as many as the placentas; ovules 2–many on each placenta, anatropous with raphe ventral. *Fruit* a 3–5-valved capsule. *Seeds* erect, usually more or less comose, or winged; albumen mealy or fleshy or 0; embryo straight.

73. **Tamarix** Linn.

Small trees or bushes; *leaves* scale-like, sheathing and stem-clasping. *Flowers* white or pink, in lateral or terminal spikes or dense racemes, occasionally diœcious. *Sepals* free, 4–5, rarely 6. *Petals* 4–5, rarely 6, inserted below the angled or lobed or crenate disk. *Stamens* 4–5 or 8–10, rising from the disk; filaments free or connate at their bases; anthers apiculate. *Ovary* narrowed upwards; styles 3–4, short, dilated into the stigmas; ovules many on a basal placenta. *Seeds* with a sessile coma; albumen 0; embryo ovoid.

Stamens 5; disk 5-lobed:—
  Leaves not sheathing; racemes long, slender ....*gallica.*
  Leaves sheathing; racemes shorter, dense; flowers diœcious ...*dioica.*
Stamens 10; glands of disk separating the filaments; leaves sheathing *ericiodes.*

116. Tamarix gallica Linn.; F. B. I. i. 248; E. D. T. 70. *T. indica* F. I. ii. 100.

On river-banks in Tirhut, Behar and Bengal.

A shrub or small tree; gregarious. *Vernac.* Jhau, banjhau, jaura.

117. Tamarix dioica Roxb.; F. I. ii. 101; F. B. I. i. 249; E. D. T. 61.

On river-banks in Bengal, also in the Sundribuns.

A shrub or small tree; gregarious. *Vernac.* Lal-jhau.

118. Tamarix ericoides Rottl.; F. B. I. i. 249; E. D. T. 68.

Chota Nagpur, in river beds and on their banks.

A bush; gregarious.

Order XVIII. ELATINEÆ.

Herbs, often minute, or undershrubs. *Leaves* opposite or whorled, entire or serrate; stipules 2, scarious or herbaceous. *Flowers* regular, hermaphrodite, axillary, solitary or in fasciculate cymes. *Disk* 0. *Sepals* 2–5, free, imbricate. *Petals* 2–5, hypogynous. *Stamens* hypogynous, free, 2–5, or 4–10; anthers 2-celled, versatile; dehiscence longitudinal lateral. *Carpels* united in a 2–5-locular superior ovary; styles as many as loculi, free; stigmas capitate; ovules many in each chamber, on the inner angle, anatropous, raphe usually lateral. *Fruit* a septicidal capsule, the central placental axis and often the septa persisting when the valves fall away. *Seeds* straight or curved with a raphe on the hollow side; albumen very scanty or 0; embryo conform to the seed.

74. **Bergia** Linn.

Annual herbs, or erect, decumbent or diffusely branched undershrubs, often pubescent; *leaves* opposite, serrate or entire. *Flowers* solitary or in axillary fascicles, minute. *Sepals* usually 5, with herbaceous midrib and membranous margins. *Petals* usually 5. *Stamens* 3–5, or 10. *Ovary* ovoid, 3–5-celled; ovules many. *Capsule* subcrustaceous, septicidal. *Seeds* many, minute.

Glabrous; stems procumbent rooting; sepals 5, petals 5, stamens 10; flowers sessile, white..*verticillata.*

Puberulous; stems erect with lower branches decumbent; sepals, petals, and stamens each 3–5, varying synchronously; flowers pedicelled, rose *ammannioides.*

119. BERGIA VERTICILLATA Willd.; F. I. ii. 456: F. B. I. i. 252.
Rice-fields and river-banks; occasional.
A small annual weed. *Vernac.* Lal-keshuriya.

120. BERGIA AMMANNIOIDES Roxb.; F. I. ii. 457; F. B. I. i. 251.
Rice-fields and river-banks; common.
A small annual weed.

Order XIX. HYPERICINEÆ.

Herbs, shrubs or, rarely, trees. *Leaves* opposite, rarely whorled, frequently gland-dotted; stipules 0. *Flowers* regular, hermaphrodite, terminal cymose or solitary, rarely axillary. *Disk* 0, or represented by hypogynous glands between the staminal bundles. *Sepals* 5, rarely 4, free, imbricate. *Petals* 5, rarely 4, hypogynous, often contorted-imbricate. *Stamens* many, rarely few, but never isomerous with petals; filaments usually connate in 3 or 5 bundles, rarely free or all connate; anthers versatile, rarely innate, 2-celled; dehiscence longitudinal lateral. *Carpels* 3–5, united in a superior 1-locular, or more or less perfectly 3–5-locular ovary, rarely carpel solitary; styles as many as carpels, free or united, stigmas terminal, capitate or truncate; ovules many to each carpel and 2-seriate, rarely few or solitary, on the axial or parietal placentas, anatropous with raphe lateral or dorsal. *Fruit* dehiscent capsular, or berry-like and indehiscent, rarely breaking up into cocci. *Seeds* usually straight; albumen 0; embryo straight or curved.

Capsule bursting septicidally; seeds not winged; a herb......**Hypericum.**
Capsule bursting loculicidally; seeds winged; a shrub ......**Cratoxylon.**

75. Hypericum Linn.

Herbs, shrubs, or small trees; *leaves* sessile, gland-dotted. *Flowers* yellow, in terminal or axillary cymes. *Sepals* 5, imbricate. *Petals* 5, usually oblique. *Stamens* numerous, free or shortly connate below in 3–8 bundles without intervening glands, or distinctly connate in 3 bundles with hypogynous glands between, or all connate at the base. *Ovary* 1-locular, with 3–5 parietal placentas, or 3–5-locular with axial placentas; styles free or connate; ovules usually numerous. *Fruit* a septicidal capsule, or dehiscing along the placentas. *Seeds* not winged.

121. HYPERICUM JAPONICUM Thunb.; F. B. I. i. 256.
Chota Nagpur, common; Tirhut; N. Bengal; E. Bengal, rare; Chittagong.
A small tufted or prostrate annual.

76. Cratoxylon Bl.

Trees or shrubs; *leaves* entire, usually chartaceous. *Flowers* in axillary or terminal cymes. *Sepals* 5, imbricate. *Petals* 5, appendaged or not at the base. *Stamens* numerous, in 3, rarely 5, bundles, with fleshy intervening hypogynous glands. *Ovary* 3-locular; styles distinct; ovules 4 or more in each loculus. *Fruit* a 3-valved, loculicidal capsule, valves bearing the septa on their centres. *Seeds* winged at the apex.

122. CRATOXYLON NERIIFOLIUM Kurz; F. B. I. i. 257; E. D. C. 2055.
Chittagong.
A shrub, 10 feet high.

Order XX. GUTTIFERÆ.

Shrubs or trees, with yellow or greenish resinous juice. *Leaves* opposite decussate, rarely whorled, simple, entire, usually coriaceous; stipules 0. *Flowers* regular, diœcious or polygamous, rarely hermaphrodite; axillary or terminal, solitary, fascicled, or in simple or panicled few-flowered cymes, very rarely subracemose. *Disk* 0, or fleshy annular. *Sepals* 2–6, imbricate, or in decussate pairs. *Petals* 2–6, rarely more or 0, usually much imbricate or contorted. ♂ *Stamens* usually many, rarely definite and as many or twice as many as petals; filaments free or all connate, or connate in bundles as many as petals; anthers adnate or terminal or agglomerate; dehiscence longitudinal, usually extrorse. ⚥ or ♀ *Staminodes*, or stamens surrounding ovary, fewer and less united than stamens in ♂. *Carpels* rarely solitary, usually several, united in a 2–many-, rarely 1-locular ovary, sessile on torus or seated on the disk; style slender, short, or 0, rarely 2; stigmas as many as loculi, free or connate, sometimes peltate; ovules in each loculus 1–2 or many, axial or erect basal. *Fruit* indehiscent, baccate or drupaceous, rarely a capsule with septicidally dehiscent valves. *Seeds* large, often with arillus or arillode; albumen 0; embryo conform to seed, with either a large radicle and obsolete cotyledons or thick cotyledons and minute radicle.

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Calyx closed before flowering, at length opening into 2 or (rarely) 3 valvate segments; petals 4; ovary 2-celled, ovules 2 in each cell; style short, stout, stigma 3-lobed; embryo a large radicle with subobsolete cotyledons .... **Ochrocarpus.**

Calyx of 4–5 free sepals :—

> Ovary (2-celled) with ovules (erect) 2 in each cell; style long, stigma peltate; embryo a small radicle with two large cotyledons; fruit by absorption of septum 1-celled, at length 4-valved; petals 4...... **Mesua.**
>
> Ovary with ovules solitary in each cell :—
>
> > Ovary 1-celled; ovule erect; style long, stigma peltate; embryo a small radicle with two large cotyledons; petals 4 or 0 **Calophyllum.**
> >
> > Ovary 2–12-celled; ovule attached to inner angle of each cell; stigma sessile or subsessile, entire or lobed, peltate; embryo a large radicle with small cotyledons; petals 4–5.................................. **Garcinia.**

77. **Ochrocarpus** Thouars.

Trees with coriaceous usually 3-nately whorled leaves. *Flowers* axillary, polygamous or hermaphrodite. *Sepals* connate in a closed calyx, opening in flower into 2, rarely 3, rather irregular valvate sepals. *Petals* 4–7 or more. *Stamens* numerous; filaments filiform, free or shortly connate below; anthers erect, oblong, or linear with dehiscence longitudinal. *Ovary* 2-celled; style short, stout, stigma 3-lobed; ovules in each cell 2 on the inner angle. *Fruit* 1–4-seeded, berry-like. *Seeds* large; embryo a large radicle with subobsolete cotyledons.

123. OCHROCARPUS LONGIFOLIUS Benth. & Hook. f.; F. B. I. i. 270; E. D. O. 6.

Orissa, Khurda; Chittagong.

A medium-sized tree. *Uriya* Chluriana; *Hind.* Nagkesar; *Beng.* Nagesar.

78. **Mesua** Linn.

Trees; *leaves* opposite, very coriaceous, often gland-dotted; veins many, slender, parallel, at right angles to midrib. *Flowers* large, showy, solitary, axillary, polygamous or hermaphrodite. *Sepals* 4, imbricate. *Petals* 4–5, imbricate. *Stamens* numerous; filaments filiform, free or connate at the base; anthers erect, oblong, 2-celled; dehiscence longitudinal. *Ovary* 2-celled; style long, stigma peltate; ovules 2 in each cell, erect. *Fruit* dehiscent, the pericarp firmly leathery, 1-celled from absorption of the septum, opening by 4 valves. *Seeds* 1–4; testa fragile, arillus 0.

124. Mesua ferrea Linn.; F. I. ii. 605; F. B. I. i. 277; E. D. M. 490.
N. Bengal, Dinajpur; Chittagong: Chota Nagpur, planted only.
A medium-sized, erect, handsome tree, with very hard wood. *Vernac.* Nagesar, Nagkesar, Nahor.

79. Calophyllum Linn.

Trees; *leaves* opposite, shining, coriaceous, with many fine parallel veins at right angles to midrib. *Flowers* polygamous, in axillary and terminal panicles. *Perianth* of 4–12, 2–3-seriate, imbricate sepals and petals. *Stamens* numerous; filaments filiform, often flexuous, free or connate below; anthers 2-celled, erect, dehiscence longitudinal. *Ovary* 1-locular; style slender, stigma peltate; ovule solitary, erect. *Fruit* subdrupaceous, with a crustaceous putamen. *Seed* erect, ovoid or globose, with very thin testa.

Leaves oblong or obovate-oblong, obtuse or emarginate, shining, margins even; racemes shorter than leaves, in upper axils; flowers ·75 in. in diam. .... *inophyllum.*
Leaves lanceolate-acuminate, margins waved; racemes as long as leaves, terminal; flowers ·35 in. in diam. .... *polyanthum.*

125. Calophyllum inophyllum Linn.; F. I. ii. 606; F. B. I. i. 273; E. D. C. 146.
Orissa, coast; elsewhere often planted.
A handsome medium-sized tree with fragrant white flowers. *Vernac.* Kath champa, sultana champa; *Uriya* Punnang; *Beng.* Punnag. The Alexandrian Laurel.

126. Calophyllum polyanthum Wall.; F. B. I. i. 274; E. D. C. 152.
Chittagong.
A tall tree. *Beng.* Kandeb.

80. Garcinia Linn.

Trees, with usually yellow juice; *leaves* very coriaceous, evergreen, opposite; stipules very rare. *Flowers* polygamous, solitary, fascicled or paniculate, axillary or terminal. *Sepals* 4–5, usually decussate. *Petals* 4–5, imbricate. ♂ *Stamens* numerous, free or connate in a ring or a globose or conical 4–5-lobed column, usually

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surrounding a rudimentary ovary; anthers sessile or on thick short filaments, 2-, rarely 4-celled, adnate or peltate, dehiscing by slits or pores or transversely. ♀ and ⚥ *Staminodes* or stamens 8 or more, free or connate. *Ovary* 2–12-celled; stigma sessile or subsessile, peltate, entire or lobed, smooth or tubercled; ovules in each cell solitary on the inner angle. *Fruit* berry-like, rind leathery. *Seeds* provided with a pulpy arillus.

Sepals and petals 4 each; stamens of ♂ in a central shortly stalked 4-angled or columnar mass; anthers quadrate dehiscing vertically; rudimentary ovary 0:—
  Male flowers in 3–many-fid terminal and axillary fascicles; fruit 4–8-grooved and -celled, apex depressed mamillary; leaves broad, lanceolate, acute at both ends .... *Cowa.*
  Male flowers in a terminal 3-chotomous panicle; fruit smooth; leaves obovate, obtuse, long-petioled .... *pedunculata.*
Sepals and petals usually 5 each; stamens in ♂ connate in 5, rarely 4, erect, discrete, pedicelled, spathulate phalanges, anther-bearing at top; male flowers fascicled shortly pedicelled; leaves large, linear-oblong, or oblong-lanceolate, acute .... *Xanthochymus.*

127. Garcinia Cowa Roxb.; F. I. ii. 622; F. B. I. i. 262; E. D. G. 22.
Behar, Monghyr; Tippera; Chittagong.
A tall erect tree. *Vernac.* Cowa.

128. Garcinia pedunculata Roxb.; F. I. ii. 625; F. B. I. i. 264; E. D. G. 82.
N. Bengal, Rangpur.
A tall tree. *Vernac.* Tikúl.

129. Garcinia Xanthochymus Hook. f.; F. B. I. i. 269; E. D. G. 99. *Xanthochymus pictorius* F. I. ii. 633.
Chittagong; elsewhere planted.
A small or medium tree. *Beng.* Dampel.

Order XXI. TERNSTRŒMIACEÆ.

Trees, or shrubs, rarely climbing. *Leaves* alternate, simple, entire or serrate, generally coriaceous; stipules 0: very rarely leaves opposite, or digitately compound or minutely stipulate. *Flowers* usually showy, generally with 2 sepaloid bracts, regular, hermaphrodite, rarely 1-sexual. *Disk* 0. *Sepals* 5, rarely 4–7, free or slightly connate, imbricate, the innermost often larger. *Petals*

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5, rarely 4–9, free or connate below, imbricate or contorted. *Stamens* many, rarely definite; filaments free or connate, usually adnate at their bases to and falling with the deciduous corolla; anthers versatile or basifixed, 2-locular; dehiscence subapical or apical, by slits rarely by pores. *Carpels* united in a 3–5-, rarely 2-, very rarely many-celled superior, rarely half-inferior ovary, sessile, wide-based; styles as many as loculi, free or united, stigmas usually small; ovules 2–many in each cell, rarely solitary, anatropous or campylotropous. *Fruit* indehiscent, soft, leathery or woody, or dehiscent capsular. *Seeds* few or many on the axial placentas; albumen scanty or 0, rarely fleshy; embryo straight, horseshoe-shaped or spiral.

Flowers small, diœcious; fruits small, indehiscent; stamens few (15 or fewer); peduncles 1-flowered; anthers basifixed ....**Eurya.**
Flower conspicuous, hermaphrodite; fruits medium, dehiscent; stamens many; anthers versatile:—
  Peduncles few- or 1-flowered; albumen scanty or 0; seeds few:—
    Seeds flat, kidney-shaped, winged on the back ....**Schima.**
    Seeds irregularly globose, wingless ....**Camellia.**
  Peduncles many-flowered; albumen copious; seeds numerous **Saurauja.**

81. Eurya Thunb.

Shrubs; *leaves* usually crenate-serrate. *Flowers* small, diœcious, sessile or shortly pedicelled in axillary fascicles, less often solitary; bracteoles persistent. *Sepals* 5. *Petals* 5, connate below. *Stamens* 15–10, rarely 5; anthers glabrous. *Ovary* 3-, rarely 2–5-celled; styles 3, rarely 2–5, free or connate; ovules numerous, on inner angle of each cell. *Fruit* small, berry-like. *Seeds* with fleshy albumen.

130. Eurya acuminata DC.; F. B. I. i. 285; E. D. C. 563.
Chittagong.
A shrub.

82. Schima Reinw.

Trees; *leaves* evergreen, thin. *Flowers* axillary, solitary or the uppermost in 3–5-flowered racemes, showy, 2-bracteolate, hermaphrodite. *Sepals* 5, free. *Petals* 5, connate at the base, the outermost concave subcucullate. *Stamens* numerous, adnate to base of petals. *Ovary* 4–6-locular, usually 5-locular; styles simple or faintly lobed above, stigmas broad spreading; ovules in each

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loculus 2–6, subpendulous from the inner angle. *Fruit* a woody, depressed, globose capsule, loculicidal with persistent axis; dehiscence much retarded. *Seeds* flat, reniform, winged on the back; albumen scanty; cotyledons leafy, accumbent.

131. SCHIMA WALLICHII Choisy; F. B. I. i. 289; E. D. S. 940.
Gordonia integrifolia F. I. ii. 572.
Chittagong.
A lofty tree. *Vernac.* Makrisal.

83. **Camellia** Linn.

Trees or shrubs; *leaves* coriaceous or membranous, evergreen, serrate. *Flowers* usually showy, axillary, solitary or subfasciculate, sessile or shortly peduncled. *Sepals* 5–6, unequal, within a series of subsimilar bracts, and graduating from these to the petals. *Petals* 5 or more, slightly connate below. *Stamens* numerous, outermost many-seriate, more or less connate and monadelphous, as well as adnate to base of petals, innermost 5–12 1–2-seriate, free. *Ovary* 3–5-locular; styles as many as loculi, free or more or less connate; ovules 4–5 in each cell, pendulous from inner angle. *Fruit* a short, woody capsule, opening loculicidally. *Seeds* usually solitary in each cell, without a wing; albumen 0; embryo straight with thick cotyledons.

132. CAMELLIA THEA Link. *C. theifera* F. B. I. i. 292; E. D. C. 244.
Cultivated in Chota Nagpur, sparingly, and in Chittagong; also in N. Bengal, Duars.
A shrub, as grown for leaf; or small tree, in the seed-lines. *Vernac.* Chhá.

84. **Saurauja** Willd.

Trees or shrubs; young branches brown with white lenticels, strigose or scaly, as are the large, usually serrate *leaves* with strong parallel veins diverging from the midrib, generally aggregated near ends of branches. *Flowers* usually hermaphrodite, in many-, rarely few-flowered cymes or panicles, axillary or from above scars of fallen leaves; bracts usually small and remote from calyx. *Sepals* 5, much imbricate. *Petals* 5, usually connate below. *Stamens* numerous; anthers with porous dehiscence. *Ovary* 3–5-locular; styles as many as loculi, free or connate. *Fruit* usually indehiscent, berry-like, rarely dry and subdehiscent. *Seeds* many, small; albumen copious.

133. Saurauja Roxburghii Wall.; F. B. I. i. 287. *Ternstrœmia serrata* F. I. ii. 521.

Chittagong.

A shrub or small tree. *Vernac.* Dalúp.

Order XXII. DIPTEROCARPEÆ.

Trees with resinous juice, rarely climbing shrubs. *Leaves* alternate, simple, entire or sinuate-crenate, with parallel secondary nerves; stipules small or large, persistent, deciduous or caducous, leaving an annular scar. *Flowers* regular, hermaphrodite, often fragrant, in axillary or terminal panicles. *Disk* 0. *Sepals* 5, connate; tube free campanulate, or short adnate to base of ovary; lobes 5, at first imbricate, later often subvalvate. *Petals* 5, contorted, connate at base or free. *Stamens* many, or 15, 10, or 5, hypogynous or subperigynous, free, connate, or adnate to the petals; filaments short, often dilated below; anthers 2-celled, outer lobes sometimes larger, connective often aristate or appendaged; dehiscence longitudinal introrse or lateral. *Carpels* united in a usually 3-locular, rarely 2- or 1-locular ovary, generally somewhat immersed in the torus; style single subulate or fleshy, stigma entire or minutely 3-lobed; ovules 2 in each cell pendulous or lateral, rarely solitary and erect, anatropous. *Fruit* usually indehiscent, nut-like, 1- rarely 2-seeded, sometimes dehiscent, capsular and 3-valved, accompanied by the usually accrescent calyx, of which 2 or more lobes are generally much enlarged and wing-like. *Seed* large, usually invested with thin testa and no albumen, very rarely (*Ancistrocladus*) with ruminate fleshy albumen; embryo with usually fleshy, often unequal, cotyledons.

Ovary 1-celled with solitary ovule; stigmas 3, distinct; seeds with copious ruminate albumen; climbing, stipules minute or 0 ......**Ancistrocladus.**
Ovary 3-celled, each cell 2-ovuled; stigmas united, more or less 3-lobed; seeds exalbuminous; trees or shrubs, leaves stipulate:—
  Fruiting calyx with a distinct tube, quite free from the fruit; 2 calyx-lobes much accrescent, erect ....**Dipterocarpus.**
  Fruiting calyx with tube very short or 0:—
    Sepals united at the base only, segments subvalvate:—
      Two calyx-lobes expanded into narrow wings ....**Vatica.**
      All calyx-lobes equal in fruit.......................................**Isauxis.**
    Sepals quite free, valvate; three outer calyx-lobes expanded in fruit **Shorea.**

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85. Ancistrocladus Wall.

Shrubs, climbing with short supra-axillary often arrested and circinately hooked branches; *leaves* glabrous, coriaceous, usually tufted, entire, reticulately veined; stipules minute, caducous, or 0. *Flowers* usually small, caducous, in terminal or lateral panicles. *Calyx* 5-lobed, lobes imbricate, tube at first short, adnate to base of ovary, finally turbinate and adnate to fruit, with lobes unequally enlarged, membranous, spreading. *Petals* 5, minute. *Stamens* subperigynous, 5 or 10. *Ovary* 1-celled, at length subinferior; styles 3, articulated to a rounded or shortly cylindric epigynous disk; ovule solitary, erect, basal or lateral. *Seeds* solitary, subglobose, testa intruded between the folds of the copious fleshy ruminate albumen; embryo short, straight.

134. ANCISTROCLADUS WALLICHII Planch.; F. B. I. i. 300.

Chittagong.

A climbing shrub with supra-axillary circinate hooks.

86. Dipterocarpus Gaertn. f.

Lofty trees; young branches more or less closely pubescent with stellate or tufted hairs; *leaves* coriaceous, entire or sinuate, lateral nerves subparallel; petiole somewhat swollen at apex; stipules large, valvate, enclosing the bud, caducous from an annular scar. *Flowers* large, reddish or white, in short or long racemes. *Calyx* 5-lobed, tube free, two of the lobes much accrescent. *Petals* 5, contorted, slightly connate below. *Stamens* numerous; anthers linear acuminate. *Ovary* 3-locular; style filiform; ovules 2 in each loculus. *Fruit* indehiscent, nucular, 1-, rarely 2-seeded, enclosed within the accrescent free calyx-tube, which is surmounted by the persistent calyx-lobes, 2 of which are enlarged into erect oblong-lanceolate coriaceous wings. *Seed* adnate to the pericarp below; albumen 0; embryo with large, thick, fleshy, unequal cotyledons.

Calyx-tube in fruit with neither ribs nor wings :—
  Young branches not pilose :—
    Young branches cylindric, canescent ....*turbinatus.*
    Young branches compressed, glabrous..............................*lævis.*
  Young branches more or less pilose ....*pilosus.*
Calyx-tube in fruit 5-ribbed or 5-winged :—
  Angles projecting on upper part of calyx-tube only [p. 252] *tuberculatus.*

*Angles or wings prolonged to base of tube :—[p. 251]

Calyx-tube with angles very narrowly winged :—

Leaves pilose both above and below ; calyx pilose ....*scaber*.

Leaves glabrous above, somewhat pubescent beneath ; calyx pubescent ....*costatus*.

Calyx-tube with angles widely winged :—

Buds ovoid ; leaves truncated to subcordate at base ; flowers 1 in. long ; enlarged calyx-lobes 1·5 in. wide ....*incanus*.

Buds cylindric ; leaves wedge-shaped to truncated at base ; flowers 1·5 in. long ; enlarged calyx-lobes ·75 in. wide ....*alatus*.

135. **Dipterocarpus turbinatus** Gaertn. f. ; F. B. I. i. 295 ; E. D. D. 701.
Tippera ; Chittagong.
A tall tree. *Beng.* Dhulia-garjan.

136. **Dipterocarpus lævis** Ham. ; E. D. D. 685. *D. turbinatus* F. I. ii. 612 ; F. B. I. i. 295.
Tippera.
A tall tree. *Beng.* Telia-garjan.

137. **Dipterocarpus pilosus** Roxb. ; F. I. ii. 615 ; F. B. I. i. 296 ; E. D. D. 692.
Chittagong.
A tall tree.

138. **Dipterocarpus tuberculatus** Roxb. ; F. I. ii. 614 ; F. B. I. i. 297 ; E. D. D. 696.
Chittagong.
A tall tree.

139. **Dipterocarpus scaber** Ham. ; F. B. I. i. 297.
Tippera.
A tall tree. *Beng.* Garjan.

140. **Dipterocarpus costatus** Gaertn. f. ; F. I. ii. 614. *D. alatus* F. B. I. i. 298.
Tippera.
A tall tree. *Beng.* Telia-garjan.

141. **Dipterocarpus incanus** Roxb. ; F. I. ii. 614 ; F. B. I. i. 298 ; E. D. D. 682.
Chittagong.
A tall tree. *Beng.* Garjan.

142. **Dipterocarpus alatus** Roxb. ; F. I. ii. 614 ; F. B. I. i. 298 ; E. D. D. 676.
Planted not infrequently.
A tall tree. *Beng.* Garjan.

In the *Flora of British India*, *Dipterocarpus lævis* is considered to be only a form of *D. turbinatus*; this is almost certainly correct. As, however, they were kept separate on account of their very different economic properties, by so careful and accurate an observer as Buchanan-Hamilton, and as no one has by actual observation in the field controverted his statements, it seems better here to leave the two trees as distinct species.

In the *Flora of British India*, *D. costatus* is reduced to *D. alatus*, on the assumption that the figure of *D. costatus* given by Gaertner is bad. As a matter of fact Gaertner's figure is an excellent representation of one of the Garjans, and there is every reason to think that the species it represents is also the tree which Roxburgh indicates by the name *D. costatus*. I cannot help thinking, however, that *D. scaber* bears to *D. costatus* much the relationship that *D. lævis* bears to *D. turbinatus*, and that it is at most only a form of Gaertner's tree. But here again no one is yet in a position to controvert the statements made by Buchanan-Hamilton; this being so, the two trees are better treated, for the moment, as distinct. It has been suggested that *D. incanus*, or at all events the tree we know by that name nowadays, is not a Chittagong species. The same remark might apply to *D. alatus*, of which I have seen no Chittagong specimens, or to *D. turbinatus*. I am, however, prepared to believe that when Roxburgh says he got two species with a 5-winged calyx in Chittagong he *did* get them there. The 5-ribbed species (*D. costatus*), it will be observed, he states distinctly that he did not get from Chittagong, but from the coast south of Chittagong. Buchanan-Hamilton got it, however, on the coast just north from Chittagong, so that it is likely enough to be found in Chittagong if only it is carefully looked for. It is to be hoped that if ever a second edition of this work is called for, the editor may be able to record that the identity of these Garjans has been satisfactorily settled by some one resident in Chittagong. It is not a matter for congratulation that we know less about trees so important as the Garjans than was known by English residents in Bengal 90 years ago.

87. **Vatica** Linn.

Medium or small trees; *leaves* coriaceous, entire, reticulately veined; stipules small, caducous or inconspicuous. *Flowers* in axillary panicles. *Calyx* 5-lobed, tube very short, adnate to base of ovary, lobes at first imbricate, at length subvalvate, persistent, and two of them considerably accrescent in fruit. *Petals* 5. *Stamens* 15; anthers oblong, connective apiculate. *Ovary* 3-locular; style short, subulate clavate or capitate, stigma entire or 3-toothed; ovules 2 in each loculus. *Fruit* a coriaceous 3-valved capsule, or indehiscent leathery, resting on the accrescent calyx-tube, with

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persistent spreading segments, of which 2 are accrescent as linear wings. *Seeds* 1–2; embryo with fleshy cotyledons.

143. VATICA SCAPHULA Dyer; F. B. I. i. 301; E. D. V. 45. *Hopea scaphula* F. I. ii. 611.
Chittagong.
A tall tree. *Beng.* Boilshura.

88. Isauxis Arn.

Medium trees; *leaves* coriaceous, entire, reticulately veined; stipules small caducous. *Flowers* in axillary panicles. *Calyx* 5-lobed, tube short, adnate to base of ovary; lobes subvalvate, equal. *Petals* 5. *Stamens* 15; anthers apiculate. *Ovary* 3-locular; style clavate, stigma 3-toothed; ovules 2 in each loculus. *Fruit* a coriaceous 3-valved capsule resting on the accrescent calyx-tube and surrounded by the somewhat accrescent, equal, spreading lobes. *Seeds* 1–2, embryo with fleshy cotyledons.

144. ISAUXIS LANCEÆFOLIA King. *Vateria lanceæfolia* F. I. ii. 601. *Vatica lanceæfolia* F. B. I. i. 302; E. D. V. 40.
Chittagong.
A medium-sized tree. *Vernac.* Mohal.

89. Shorea Roxb.

Trees, with glabrous or pubescent young branches; *leaves* entire or subrepand, coriaceous, lateral veins subparallel; stipules large, coriaceous, persistent, or small caducous. *Flowers* in axillary or terminal laxly panicled cymes; bracts persistent or caducous, or 0. *Calyx* 5-lobed, tube very short, adnate to the thalamus; segments imbricate, persistent, and three accrescent in fruit. *Petals* 5. *Stamens* 15, or 20, or numerous; anthers with usually subulate, cuspidate, rarely blunt connective and obtuse, rarely cuspidate lobes. *Ovary* 3-locular; style subulate, stigma entire or 3-toothed; ovules 2 in each loculus. *Fruit* leathery indehiscent, rarely 2-valved dehiscent, closely surrounded by the persistent calyx-segments of which the three outermost are enlarged into coriaceous linear wings. *Seed* usually solitary; embryo with large fleshy cotyledons.

145. SHOREA ROBUSTA Gaertn. f.; F. I. ii. 615; F. B. I. i. 306; E. D. S. 1656.
Tirhut; N. Bengal; Chota Nagpur.
A fine tree. *Vernac.* Sal (*general*); *Santal.* Sarjour; *Uriya* Sekwa.

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Order XXIII. MALVACEÆ.

Herbs, shrubs, or trees, often stellate-haired, inner bark fibrous, wood soft, juice mucilaginous or rarely acid. *Leaves* alternate, palminerved at base, simple, lobed or rarely digitately compound; stipules 2, sometimes caducous. *Flowers* regular, hermaphrodite, rarely diœcious or polygamous; bracteoles 3 or more, scattered or approximated, free or connate, often forming an epicalyx. *Disk* small, often produced upwards between the carpels. *Sepals* 5, valvate, connate at base or free. *Petals* 5, adnate below to staminal column, contorted in bud, often oblique. *Stamens* many, rarely definite; filaments combined in a tube adnate below to the petals, variously divided at the top into antheriferous lobes; anthers 1-celled (very rarely a few 2-celled), cells sinuous linear or reniform; dehiscence longitudinal extrorse. *Carpels* many, whorled, connate or free; styles free, or partly or quite connate, stigmas linear or spathulate on inner face or capitate; ovules 1 or more in each cell, axial on the inner angle, amphitropous, raphe usually ventral. *Fruit* of dry indehiscent or dehiscent cocci, or capsular and loculicidal, sometimes large and woody. *Seeds* obovoid globose or reniform, glabrous or hairy; albumen mucilaginous, scanty, or 0; embryo curved.

*Leaves simple, entire or lobed; sepals leafy:—[p. 256]

†Carpels separating from the axis when ripe as dehiscent or indehiscent cocci:—[p. 256]

Styles as many as the carpels:—

Bracteoles 3; ripe carpels after separating indehiscent, 1-seeded; ovules solitary ascending:—

Stigmas linear; carpels many ....**Malva.**

Stigmas capitate; carpels 8–12 ....**Malvastrum.**

Bracteoles 0; ripe carpels after separating dehiscent:—

Carpels without a false dissepiment:—

Ovules solitary pendulous; carpels 1-seeded; forenoon- or noon-flowering plants with small leaves and flowers ......**Sida.**

Ovules 2 or more; carpels 1- or more-seeded; afternoon- or evening-flowering plants with rather large leaves and medium flowers..**Abutilon.**

Carpels with a transverse false dissepiment...........**Wissadula.**

Styles twice as many as carpels; carpels 1-seeded:—

‡Carpels opposite sepals, dehiscent after separating; bracteoles 10 [p. 256] ....**Pavonia.**

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‡Carpels opposite petals, indehiscent after separating :—[p. 255]

Bracteoles connate 5 ; carpels spinescent or unarmed ; flowers pink .... **Urena.**

Bracteoles intermixed with flowers, or 0 ; flowers in dense heads ; carpels unarmed ; flowers yellow or white................ **Malachra.**

†Carpels when ripe forming a capsule :—[p. 255]

Stigmas spreading ; seeds reniform :—

Ovary 3-celled, ovules 2 in each cell ascending ; flowers panicled, polygamous ; small trees .... **Kydia.**

Ovary 5-celled, sometimes spuriously 10-celled from false dissepiments, cells opposite petals, with three or more ovules ; flowers axillary .... **Hibiscus.**

Stigmas cohering in a club-shaped mass :—

Bracteoles 3, large cordate ; seeds cottony .... **Gossypium.**

Bracteoles 3–5, small ; seeds not cottony .... **Thespesia.**

*Leaves digitately compound ; sepals leathery ; bracteoles 0 ; tall trees :—[p. 255]

Calyx 5-cleft ; fruit oblong, woody, indehiscent ; seeds not packed in cotton ; staminal tube long ; flowers white .... **Adansonia.**

Calyx truncate or irregularly toothed ; fruit ovoid, dehiscent ; seeds packed in cotton ; staminal tube short :—

Valves of capsule woody ; flowers red ; stamens many ...... **Bombax.**

Valves of capsule thickly coriaceous ; flowers white ; stamens few **Eriodendron.**

90. **Malva** Linn.

Herbs ; *leaves* lobed, pubescent. *Flowers* axillary fasciculate ; bracteoles 3, distinct. *Sepals* 5, connate at the base. *Petals* 5, emarginate, slightly connate below. *Stamens* numerous, in a tube antheriferous to the top, without sterile teeth. *Ovary* many-locular ; styles as many as carpels, stigmas linear ; ovules solitary in each loculus. *Fruit* consisting of separating but indehiscent ripe carpels. *Seed* solitary, ascending in each separate coccus.

146. MALVA VERTICILLATA Linn. ; F. B. I. i. 320 ; E. D. M. 125.

N. Bengal ; cultivated throughout Dinajpur and Bogra as a cold weather vegetable.

An erect annual. *Beng.* Lapha, napha.

91. **Malvastrum** A. Gray.

Herbs or undershrubs with entire or divided leaves. *Flowers* axillary or in terminal spikes ; bracteoles 3, narrow. *Calyx* cupular, 5-partite. *Petals* 5, exceeding the sepals. *Stamens*

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numerous, in a tube antheriferous to the top, without sterile teeth. *Ovary* 5- or more-locular; styles as many as the carpels, stigmas capitate. *Fruit* consisting of separating but indehiscent ripe carpels, with or without beaks. *Seed* solitary, ascending in each separate coccus.

Hairs simple; carpels with three small projecting points...*tricuspidatum*.
Hairs stellate; carpels rounded or angular not beaked............*spicatum*.

147. Malvastrum tricuspidatum A. Gray; F. B. I. i. 321.
In waste places; common in W. and C. Bengal.
An erect herb.

148. Malvastrum spicatum A. Gray; F. B. I. i. 321.
In waste places in C. Bengal, rare.
An erect herb.

92. **Sida** Linn.

Herbs or undershrubs; *leaves* simple or lobed. *Flowers* sessile or peduncled, solitary or fascicled, axillary or in terminal racemes or heads or spikes; bracteoles 0. *Calyx* of 5 sepals connate below in a tube. *Petals* 5, free above, connate below and also adnate to staminal column. *Stamens* many, connate, tubular below, dividing above into distinct antheriferous filaments. *Carpels* 5 or more, whorled 1-seriate; styles free as many as carpels, stigmas terminal. *Fruit* consisting of separating ripe carpels generally 2-awned at the tip and opening irregularly to admit of the fall of the seed. *Seed* solitary, pendulous or horizontal in each ripe carpel.

Leaves cordate at the base:—
Pedicels jointed in the middle; petiole not so long as leaf-blade; leaves always acute at tip; carpels 5:—
Stem trailing; leaves and slender branches sparingly hispid but not glutinous ....*veronicifolia*.
Stems erect; leaves and stoutish branches glutinous ......*glutinosa*.
Pedicels jointed under the flower:—
Leaves *always cordate at base*, usually acute but sometimes obtuse at tip; petiole as long as leaf-blade; carpels 10 ....*cordifolia*.
Leaves *only sometimes cordate at base*, *always obtuse at tip;* petiole shorter than leaf-blade; carpels 5 ....*spinosa*.
Leaves cuneate at the base:—
Carpels membranous, never more than 5; branches usually with spiny tubercles below the leaves; peduncles jointed near the flower,

as long as or longer than the petiole ; leaves hoary beneath, *sometimes cordate at base ;* stipules shorter than the petiole..................*spinosa.*

Carpels crustaceous, rarely so few as 5 ; branches never spinescent ; *leaves always cuneate at base ;* stipules longer than the petiole :—

Leaves nearly glabrous, narrow, acuminate, serrate ; peduncle jointed in the middle as long as petiole ; carpels 5–9, awned *acuta.*

Leaves pubescent to hoary beneath ; peduncle longer than petiole, jointed near base :—

Leaf-blade rhomboid acute ....*rhombifolia* var. *typica.*

Leaf-blade rhomboid obtuse or subacute *rhombifolia* var. *rhomboidea.*

Leaf-blade obovate ....*rhombifolia* var. *obovata.*

149. SIDA VERONICIFOLIA Lamk. *S. humilis* F. I. iii. 171 ; F. B. I. i. 322 ; E. D. S. 1699.

Everywhere common.

A procumbent branching weed of waste places. *Beng.* Junka ; *Santal.* Jokka sakam.

150. SIDA GLUTINOSA Cav. ; F. I. iii. 172. *S. mysorensis* F. B. I. i. 322.

W. Bengal ; Behar ; Chota Nagpur.

A glutinous erect herb.

151. SIDA CORDIFOLIA Linn. ; F. I. iii. 177 ; F. B. I. i. 324 ; E. D. S. 1694.

W. Bengal ; Behar ; Chota Nagpur.

A softly hairy erect weed. *Beng.* Berela.

This is often very difficult to distinguish from the cordate-leaved form of *S. spinosa ;* the best character in this case is the number of carpels.

152. SIDA SPINOSA Linn. ; F. B. I. i. 323 ; E. D. S. 1714. *S. alba* F. I. iii. 174.

Behar ; Chota Nagpur.

A weed. *Beng.* Ban-methi ; *Hind.* Jangli-methi.

There are two forms of this species ; one has leaves cuneate at the base (*S. alba*) ; the other has cordate-based leaves (*S. alnifolia*). The latter is not easily separated, except by its only having 5 carpels, from *S. cordifolia ;* the former is not always easily separated, except by its thinner-walled carpels and its peduncles jointed very high up, from certain varieties of *S. rhombifolia.* Owing to the existence of these two forms, which are perhaps specifically distinct, it is necessary to show *S. spinosa* twice in the key.

153. SIDA ACUTA Burm.; F. I. iii. 171. *S. carpinifolia* F. B. I. i. 323; E. D. S. 1688.
Everywhere common.
A weed of waste places and waysides. *Beng.* and *Hind.* Kureta.

154. SIDA RHOMBIFOLIA Linn.; F. I. iii. 176; F. B. I. i. 323. E. D. S. 1703.
Everywhere common in localities like the last.
A shrubby perennial weed. *Beng.* Lal berela.

154/2. Var. RHOMBOIDEA F. B. I. i. 324. *S. rhomboidea* F. I. iii. 176; E. D. S. 1706.
Chota Nagpur, common; Bengal, rare.
A shrubby perennial. *Beng.* Swet berela.

154/3. Var. OBOVATA F. B. I. i. 324; E. D. S. 1707.
Tirhut; Behar.
A shrubby perennial weed.

93. **Abutilon** Gaertn.

Herbs or undershrubs; stems and lobed or angled *leaves* more or less downy. *Flowers* usually axillary; bracteoles 0. *Calyx* of 5 sepals connate below. *Petals* 5, connate below and adnate to base of staminal tube. *Stamens* numerous, united below in a tube, separating above into distinct antheriferous filaments. *Carpels* 5 or more; styles as many as the carpels. *Fruit* of awned or blunt ripe carpels that separate from the axis entirely, or remain attached by their bases, and dehisce by 2 valves to admit of escape of the seed. *Seeds* 1 or more in each carpel, reniform, the upper ascending the lower usually suspended or horizontal.

Carpels 5; filaments free nearly to the base; leaves roundish cordate with a long acumen, downy beneath ....*polyandrum.*
Carpels 15–20; filaments free at apex only:—
  Leaves cordate, covered on both sides with white felted down; peduncles longer than petioles ....*indicum.*
  Leaves orbicular cordate with a long point, softly tomentose; peduncles shorter than petioles ....*Avicennæ.*

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155. ABUTILON POLYANDRUM Schlecht.; F. B. I. i. 325; E. D. A. 98. *Sida polyandra* F. I. iii. 173.
Chota Nagpur, very common.
An erect woody herb.

156. ABUTILON INDICUM G. Don; F. B. I. i. 326; E. D. A. 89. *Sida indica* F. I. iii. 179.
Everywhere, a very common weed.
An erect woody herb. *Beng.* Petari, jhampi; *Hind.* Jhampi, kanghani; *Santal.* Miru baha.

157. ABUTILON AVICENNÆ Gaertn.; F. B. I. i. 327; E. D. A. 82. *Sida Abutilon* F. I. iii. 178.
Bengal, Dacca, &c.; somewhat rare.
An erect herb.

94. **Wissadula** Medik.

Undershrubs; stems and palmately lobed *leaves* usually softly hairy. *Flowers* in lax terminal panicles; bracteoles 0. *Sepals* 5, connate below. *Petals* 5, connate and adnate to staminal tube below. *Stamens* numerous, connate in a tube below, divided above into separate antheriferous filaments. *Carpels* usually 5, whorled 1-seriate; styles as many as carpels. *Fruit* consisting of 5 many-seeded, beaked, dehiscent ripe carpels, each with usually a transverse dissepiment. *Seeds* 1–3 in each loculus, the lower suspended the upper ascending.

158. WISSADULA ROSTRATA Planch.; F. B. I. i. 325; E. D. W. 91. *Sida periplocifolia* F. I. iii. 178.
C. Bengal, an occasional escape; elsewhere cultivated but not commonly.
An undershrub.

95. **Pavonia** Cav.

Herbs or undershrubs, with entire, angled or lobed more or less pubescent leaves. *Flowers* axillary or clustered at the ends of the branches; bracteoles 5 or more, free or forming a tube below the calyx. *Calyx* 5-partite. *Petals* 5, adnate below to base of staminal column. *Stamens* numerous, united in a tube, antheriferous without, truncate or 5-toothed at the apex. *Ovary* 5-locular; loculi usually opposite the sepals, rarely opposite the petals; styles 10, stigmas capitate; ovules solitary in each loculus. *Fruit* consisting of ripe carpels that separate from the axis but may themselves be

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indehiscent or more or less 2-valved, smooth netted or winged. *Seed* solitary in each cell, ascending.

159. Pavonia odorata Willd.; F. I. iii. 214; F. B. I. i. 331; E. D. P. 344.

Chota Nagpur.

A weed of fields and waste places. *Vernac.* Bálá.

96. **Urena** Linn.

Herbs or undershrubs; *leaves* angled or lobed and stems more or less clothed with rigid stellate hairs. *Flowers* small, sessile or shortly peduncled, usually clustered; bracteoles 5, adnate to the calyx and sometimes connate below in a cup. *Calyx* 5-cleft. *Petals* 5, tomentose externally, connate at base and there adnate to base of staminal column. *Stamens* many, connate in a tube antheriferous without, truncate or minutely toothed at the top. *Ovary* 5-locular, loculi opposite the petals; styles with 10 stigmatic branches, stigmas capitate; ovules solitary in each loculus. *Fruit* consisting of 5 ripe carpels, covered with hooked bristles or smooth, separating from the axis but themselves indehiscent. *Seed* solitary in each coccus, ascending.

Carpels armed with hooked bristles:—
  Leaves rounded, angled, not divided beyond the middle ....*lobata.*
  Leaves divided beyond the middle into 5 oblong lobes narrowed at the base ....*sinuata.*
Carpels smooth, unarmed..........*repanda.*

160. Urena lobata Linn.; F. I. iii. 182; F. B. I. i. 329; E. D. U. 29.

Everywhere very common.

A weed of waste places and roadsides.

Beng. Bun-okra; *Santal.* Bhidi janetet.

161. Urena sinuata Linn.; F. I. iii. 182; F. B. I. i. 329; E. D. U. 33.

Especially frequent in Chota Nagpur; more sparingly in the other provinces.

Beng. Kunguiya; *Hind.* Lobloti; *Santal.* Mota bhidi janetet.

162. Urena repanda Roxb.; F. I. iii. 182; F. B. I. i. 330; E. D. U. 31. *U. palmata* F. I. iii. 182.

Chota Nagpur; common.

A shrub. *Santal.* Sikuar.

97. **Malachra** Linn.

Herbs; *leaves* angled. *Flowers* in dense heads, intermixed with bracteoles. *Sepals* 5, connate below. *Petals* 5, connate at the base and there adnate to the base of the staminal tube. *Stamens* numerous, connate below in a short tube, truncate or 5-toothed at its mouth and there dividing into many antheriferous filaments. *Carpels* 5, 1-seriate; styles 10; ovules solitary in each carpel. *Fruit* of 5 ripe carpels separating from the axis but themselves indehiscent. *Seed* solitary in each carpel, ascending, reniform.

163. MALACHRA CAPITATA Linn.; F. B. I. i. 329; E. D. M. 60.
Common everywhere, but especially so in E. and C. Bengal; now extending into the Sundribuns.
A weed of waste places. *Vernac.* Ban-bhindi.

98. **Kydia** Roxb.

Trees; *leaves* palminerved, usually lobed, stellately hairy. *Flowers* polygamous, in close panicles; bracteoles 4–6, leafy, connate below, accrescent and spreading in fruit. *Sepals* 5, connate at the base. *Petals* 5, obcordate, oblique, adnate below to the staminal tube. *Stamens* about 15, united below in a tube which separates above the middle into 5 bundles each bearing 3 reniform anthers which are imperfect in functional female flowers. *Ovary* 2–3-locular; style 3-cleft, stigmas 3, peltate, imperfect in functional male flowers; ovules in each loculus 2, ascending. *Fruit* a subglobose, obtuse, loculicidally 3-valved capsule. *Seeds* reniform, furrowed.

164. KYDIA CALYCINA Roxb.; F. I. iii. 188; F. B. I. i. 348; E. D. K. 42.
W. Bengal; Behar; Chota Nagpur.
A tree. *Vernac.* Pola.

99. **Hibiscus** Medik.

Herbs, shrubs, or trees; *leaves* more or less palmately lobed, stipulate. *Flowers* axillary; bracteoles 5 or more, rarely 3 or 0, free or connate at the base. *Calyx* 5-toothed or 5-fid, rarely spathaceous circumscissile. *Petals* 5, connate at the very base and there adnate to staminal column. *Stamens* numerous, connate in a tube, truncate or 5-toothed at the apex, giving off near and below the top many antheriferous filaments bearing reniform anthers. *Ovary*

5-locular, loculi opposite the sepals; styles 5, connate below, stigmas capitate or subspathulate; ovules 3 or more in each loculus. *Fruit* a loculicidally 5-valved capsule sometimes with a separating endocarp, sometimes spuriously 10-celled from the formation of vertical false dissepiments. *Seeds* glabrous, hairy or woolly.

- *Herbs; bracteoles of involucre always free from each other and (except *H. cannabinus*) free from calyx-tube; often 0 in *H. Solandra*:—[p. 264]
  - Calyx elongate, spathaceous, 5- rarely 3-toothed, deciduous by basal circumscissile dehiscence; bracteoles 5–20, always quite free, often caducous; seeds smooth:—
    - Flowers small white; bracteoles short, small, caducous before the flower opens .... *ficulneus.*
    - Flowers large yellow with a maroon or purple eye; bracteoles narrow and many or wide, leafy and few:—
      - Bracteoles 6–15, narrow linear:—
        - Capsule elongated-conical, 7-angled; bracteoles 8–10... *esculentus.*
        - Capsule short, 5-angled:—
          - Bracteoles 6–12, much shorter than the oblong capsule *Abelmoschus.*
          - Bracteoles 10–15, as long as the ovoid capsule...... *cancellatus.*
      - Bracteoles 4–6, broad leafy:—
        - Leaves almost glabrous; bracteoles glabrous except the tomentose margin .... *Manihot.*
        - Leaves and bracteoles more or less hispid and bristly:—
          - Flowers only 2 in. across; bracteoles usually 4 only *tetraphyllus.*
          - Flowers 5–8 in. across:—
            - Bracteoles 4 or 5, flowers under 6 in. across .... *pungens.*
            - Bracteoles 6, flowers over 6 in. across .... *hostilis.*
  - Calyx short, not spathaceous, 5-cleft, persistent:—
    - Calyx membranous, ventricose; bracteoles numerous linear; seeds smooth; flowers yellow with a purple eye .... *Trionum.*
    - Calyx herbaceous, not inflated:—
      - †Calyx-lobes equally 3–5-nerved, margins not thickened; bracteoles without appendages; sometimes bracteoles 0:—[p. 264]
        - §Capsules smooth, globose, shorter than the calyx; flowers small, pink or white, peduncles as long as the leaves; seeds cottony; bracteoles conspicuous:—[p. 264]
          - Leaves more or less 3-lobed, glandular beneath; corolla spreading .... *hirtus.*
          - Leaves entire or only serrate, not glandular; corolla reflexed *micranthus.*

§Capsules hirsute, oblong acuminate or truncate apiculate; seeds hairy, but not cottony :—[p. 263]

Flowers small concolorous yellow or white; peduncles as long as petioles; bracteoles minute or altogether wanting; capsules sparsely hirsute longer than calyx........................*Solandra.*

Flowers large yellow with maroon or purple eye; bracteoles conspicuous; capsules very hairy :—

Capsule longer than calyx, acuminate, not winged; sepals 3-nerved; all parts densely glutinously hairy *panduræformis.*

Capsule shorter than calyx, truncate apiculate, 5-winged; sepals 5-nerved; all parts softly villous...............*vitifolius.*

†Calyx-lobes with a prominent midrib and with usually thickened indurated borders :—[p. 263]

Bracteoles bearing on the back an oblong or linear appendage :—

Appendages of bracteoles leafy, oblong; flowers pale yellow with a purple eye :—

Flowers short-peduncled, 2 in. across; stipules lanceolate; stem stiffly hirsute and usually prickly...............*furcatus.*

Flowers on long slender stalks, 1 in. across; stipules large leafy, semi-lunar; stem always prickly ....*surattensis.*

Appendages of bracteoles linear, or occasionally 0; flowers white or pale yellow with purple eye; midrib of calyx-lobes without gland ....*radiatus.*

Bracteoles without any appendage on the back :—

Calyx dry, horny in fruit, lobes prickly, midrib of each with a large gland; bracteoles adnate to base of calyx-tube; seeds glabrous ....*cannabinus.*

Calyx fleshy, red, lobes not prickly; midrib without gland; bracteoles not adnate; seeds hispid ....*Sabdariffa.*

*Shrubs, erect or rarely climbing, or trees; bracteoles always present, often connate at base but never adnate to calyx :—[p. 263]

‡Carpels not subdivided by spurious dissepiments :—[p. 265]

Climbing; bracteoles 5, connate at base; leaves with angular outline, cordate at base; flowers small, yellowish white with crimson eye, in many-flowered terminal panicles ....*scandens.*

Erect shrubs or trees :—

Bracteoles 6–7, free; leaves not cordate at base, glabrous :—

Peduncles shorter than petioles; bracteoles linear ......*syriacus.*

Peduncles longer than petioles; bracteoles lanceolate *Rosa-sinensis.*

Bracteoles 10; leaves cordate at base, tomentose or setose :—

Bracteoles free; all parts densely scurfily tomentose; leaves angled or lobed; flower white changing to rose ....*mutabilis*.

Bracteoles shortly connate at base; all parts setose; leaves regularly cordate; stipules large spathulate; flower yellow with rose-coloured veins; capsules with no trace of spurious dissepiment; seeds with cottony margins............*macrophyllus*.

‡Carpels more or less completely subdivided by spurious vertical septa; bracteoles 10, connate at base into a distinct cup; seeds glabrous:— [p. 264]

Free portion of bracteoles twice as long as cupular base; carpels 2-locular only at the base; leaves regularly cordate; stipules large spathulate; flowers yellow with rose-coloured veins ....*tortuosus*.

Free portions of bracteoles much shorter than cupular base; carpels completely 2-locular throughout; stipules medium lanceolate; flowers yellow with crimson eye, changing to brownish red:—

Leaves always cordate, closely white pubescent beneath *tiliaceus*

Leaves usually 3-partite, sparsely pubescent beneath ......*tricuspis*.

165. HIBISCUS FICULNEUS Linn.; F. B. I. i. 340; E. D. H. 215. *H. prostratus* F. I. iii. 208. *H. strictus* F. I. iii. 206.

Behar; in fields.

An annual. There are two forms, as indicated in the F. I.; they are not, however, specifically distinct. Leaves at base rounded cordate, those higher up and younger palmately lobed, lobes rounded sinuses wide. *Beng.* Bandheras, jangli bhindi.

166. HIBISCUS ESCULENTUS Linn.; F. B. I. i. 343; E. D. H. 196. *H. longifolius* F. I. iii. 210.

Everywhere cultivated in gardens.

A herb. *Beng.* Bhindi, dheras; *Hind.* Bhindi, ramturai. The "Lady's Fingers," or Ochro.

167. HIBISCUS ABELMOSCHUS Linn.; F. I. iii. 202; F. B. I. i. 342; E. D. H. 168.

N. Bengal; Chittagong.

A herb, 2–3 feet high; seeds smell of musk. *Beng.* Kalkastari, mushak-dhana. The Musk Mallow.

168. HIBISCUS CANCELLATUS Roxb.; F. I. iii. 201; F. B. I. i. 342.

Behar, Rajmahal Hills; Chota Nagpur, common.

A herb with very bristly leaves and stems, 2–3 feet high.

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169. Hibiscus Manihot Linn.; F. B. I. i. 341. *H. pentaphyllus* F. I. iii. 212.
C. Bengal, naturalised.
A tall almost glabrous herb, native of China.

170. Hibiscus tetraphyllus Roxb.; F. I. iii. 211; F. B. I. i. 341; E. D. H. 252.
C. Bengal, near Calcutta.
An annual hispid slightly prickly herb.

The locality quoted is taken from the F. I. It appears never to have been collected near Calcutta since Roxburgh's day. The plants that were issued by Wallich as *H. tetraphyllus* are, in my opinion, only a form of *H. pungens*; they certainly are not the Concan and Canara plant that agrees with the coloured drawing which Roxburgh has left of his *H. tetraphyllus*.

171. Hibiscus pungens Roxb.; F. I. iii. 213; F. B. I. i. 341.
Behar, Rajmahal Hills, rather common.
A tall, very bristly species with broad, leafy bracteoles and very large flowers.

172. Hibiscus hostilis Wall.; F. B. I. i. 342.
Chittagong.
Taller, more bristly and with larger flowers than the preceding but hardly deserving to be considered a different species.

173. Hibiscus Trionum Linn.; F. B. I. i. 334.
Bengal, cultivated only.
A pubescent annual with orbicular lower leaves and 3–5-partite upper leaves, in shape rather like those of *H. ficulneus*.

174. Hibiscus hirtus Linn.; F. B. I. i. 335. *H. phœniceus* F. I. iii. 194.
Behar, frequent; probably, however, only an escape from gardens.
In habit somewhat shrubby. *Beng.* Lal-surgumuni.

175. Hibiscus micranthus Linn.; F. B. I. i. 335. *H. rigidus* F. I. iii. 195.
Behar; Chota Nagpur.
Shrubby, very like the preceding in habit.
A weed of waste places and roadsides.

176. **Hibiscus Solandra** L'Herit.; F. I. iii. 197; F. B. I. i. 336. *H. pumilus* F. I. iii. 203.

Behar, occasional.

A weed of waste places and roadsides.

177. **Hibiscus panduræformis** Burm.; F. B. I. i. 338. *H. tubulosus* F. I. iii. 196.

Behar; Chota Nagpur.

A herb.

178. **Hibiscus vitifolius** Linn.; F. I. iii. 200; F. B. I. i. 338; E. D. H. 263. *H. truncatus* F. I. iii. 200.

In all the provinces, common.

A common weed. Roxburgh's *H. truncatus* is a small form growing in poor soil. *Beng.* Ban-kapas.

179. **Hibiscus furcatus** Roxb.; F. I. iii. 204; F. B. I. i. 335; E. D. H. 219.

Chota Nagpur.

Erect, shrubby, softly downy and armed with scattered recurved prickles.

180. **Hibiscus surattensis** Linn.; F. I. iii. 205; F. B. I. i. 334; E. D. H. 250.

Bengal, not common; Chittagong.

Weak-stemmed, prostrate, softly downy and sparingly armed with prickles.

181. **Hibiscus radiatus** Willd.; F. I. iii. 209; F. B. I. i. 335.

Bengal, cultivated.

Almost shrubby, prickly.

182. **Hibiscus cannabinus** Linn.; F. I. iii. 208; F. B. I. i. 339; E. D. H. 177.

Tirhut, Behar, and Chota Nagpur; cultivated.

A herb with strict, glabrous, prickly stems. *Beng.* Mesta-pat, ambya-pat; *Hind.* Ambári; *Santal.* Dare kudrum; *Uriya* Kanuria.

183. **Hibiscus Sabdariffa** Linn.; F. B. I. i. 340; E. D. H. 233.

Cultivated everywhere.

A well-known vegetable; used also to make a conserve like red-currant jelly. *Beng.* Mesta; *Hind.* Patwa; *Santal.* Arak kudrum, togot arak. The Rozelle.

184. **Hibiscus scandens** Roxb.; F. I. iii. 200; F. B. I. i. 337.

Chittagong.

A woody climber.

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185. **Hibiscus syriacus** Linn.; F. I. iii. 195; F. B. I. i. 344.
In gardens everywhere.
A shrub. *Beng.* Sada-juva.

186. **Hibiscus Rosa-sinensis** Linn.; F. I. iii. 194; F. B. I. i. 344; E. D. H. 227.
In gardens everywhere.
A shrub. The shoe flower. *Beng.* Juva; *Hind.* Jasúm.

187. **Hibiscus mutabilis** Linn.; F. I. iii. 201; F. B. I. i. 344; E. D. H. 224.
In most gardens.
A small tree. *Vernac.* Thalpadma.

188. **Hibiscus macrophyllus** Roxb.; F. B. I. i. 337; E. D. H. 224. *H. setosus* F. I. iii. 194.
Chittagong.
A small tree or large shrub everywhere setose. *Beng.* Kashia udal, kashia palla.

189. **Hibiscus tortuosus** Wall.
Sundribuns.
A rambling bush.

This is not the variety "tortuosus" of the next species (F. B. I. i. 343) which was issued by Wallich under his number 1913/B according to the F. B. I., but is the plant from the "Estuary of the Ganges" issued by Wallich as 1913/A, of which the F. B. I. takes no notice. It has much the appearance of the next species in foliage, but the large stipules and long bracteoles amply distinguish it. As regards both stipules and bracteoles it is closely related to *H. macrophyllus*, but it has none of the setæ; moreover, its capsules are partially subdivided and its seeds are not hairy. This should be the real *H. macrophyllus* of Roxburgh if that species be rightly referred by Voigt to *Paritium*—the section of *Hibiscus* with subdivided carpels. The plant figured by Wallich as *H. macrophyllus* is, however, *H. setosus* where there is not even a rudiment of a false dissepiment. The *H. tortuosus* of Roxburgh is, as his figure shows, only *H. tiliaceus*, not being separable even as a variety. Wallich is the only botanist who has reported our present plant as a wild species. It is still plentiful in the Calcutta Botanic Gardens, but the only species reported from the Sundribuns of late years has been the well-known "Bola," *H. tiliaceus*. *H. tortuosus* ripens its fruits regularly but always has abortive seeds; it is, with hardly a doubt, a natural hybrid *H. setosus* (*macrophyllus*) × *tiliaceus*.

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190. HIBISCUS TILIACEUS Linn.; F. I. iii. 192; F. B. I. i. 343; E. D. H. 255. *H. tortuosus* F. I. iii. 192.
Orissa; Sundribuns; Chittagong: always near the sea.
A large shrub or small much-branched tree. *Beng.* Bola; *Uriya* Baria.

191. HIBISCUS TRICUSPIS Banks; F. I. iii. 202; F. B. I. i. 344; E. D. H. 261.
Frequently planted.
A tree. *Vernac.* Gurhul.

100. Gossypium Linn.

Herbs, shrubs, or low trees; *leaves* palmately lobed. *Flowers* axillary, large, yellow usually with crimson centre, or purplish, solitary on jointed peduncles; bracteoles 3, large, leafy, cordate. *Calyx* cupular, truncate or slightly 5-toothed. *Petals* connate slightly at the base and there adnate to the staminal tube. *Stamens* numerous, connate in a tube, truncate or 5-toothed at the top, giving off below the apex many antheriferous filaments. *Ovary* 5-locular; style clavate, 5-grooved at the apex, stigmas 5; ovules in each loculus numerous. *Fruit* a loculicidally 3–5-valved capsule. *Seeds* densely clothed with woolly hairs.

Annual; seeds free, clothed with closely adhering silky down; bracteoles not divided below the middle ....*herbaceum.*
Perennial, shrubby; seeds black, free or cohering, without adhering pubescence, bracteoles deeply incised ....*acuminatum.*

192. GOSSYPIUM HERBACEUM Linn.; F. I. iii. 184; F. B. I. i. 340; E. D. G. 404.
Cultivated.
A small shrub. *Vernac.* Kapas, tula, rui.

193. GOSSYPIUM ACUMINATUM Roxb.; F. I. iii. 189; E. D. G. 400. *G. barbadense* var. *acuminata* F. B. I. i. 347.
Cultivated.
A shrub. *Vernac.* Kapas.

101. Thespesia Corr.

Shrubs or trees; *leaves* entire or lobed. *Flowers* large, axillary, showy; bracteoles 5–8 arising from the thickened apex of the peduncle, deciduous. *Calyx* truncate, minutely 5-toothed, or 5-partite. *Petals* 5, connate at their bases and there adnate to staminal column. *Stamens* numerous, united in a tube, 5-toothed at the apex and giving off below the top numerous antheriferous filaments. *Ovary* 4–5-locular; style clavate, furrowed, entire or 5-toothed; ovules in each loculus few. *Fruit* a loculicidal capsule or subindehiscent. *Seeds* glabrous or tomentose.

A tree with glabrous leaves; young branches and unripe capsules covered with rusty-coloured scales ....*populnea.*

A shrub with leaves sparingly pilose above, tomentose beneath; young branches stellate-tomentose, unripe capsules densely hirsute......*Lampas.*

194. THESPESIA POPULNEA Corr.; F. B. I. i. 345; E. D. T. 392. *Hibiscus populneus* F. I. iii. 190.
Sundribuns, plentiful; elsewhere very often as a planted tree. *Beng.* Paras, paras-pipal. The Portia Tree.

195. THESPESIA LAMPAS Dalz. & Gibs.; F. B. I. i. 345; E. D. T. 387. *Hibiscus Lampas* F. I. iii. 198.
Behar; Chota Nagpur.
A small bush. *Beng.* Ban-kapas.

102. **Adansonia** Linn.

Trees, with short thick trunk, bulbous below and with spreading branches; *leaves* digitately compound, deciduous. *Flowers* axillary, solitary, long peduncled, pendulous. *Calyx* cupular, coriaceous, 5-cleft, 2-bracteolate. *Petals* 5, adnate at base to the staminal column. *Stamens* numerous, connate in a cylindric tube giving off at the top many antheriferous filaments. *Ovary* 5–10-locular; style long, exserted, divided into as many branches as there are loculi, stigmas radiating; ovules in each cell numerous. *Fruit* oblong, woody, velvety outside, indehiscent. *Seeds* reniform, with a thick testa and scanty albumen, embedded in a mealy pulp.

196. ADANSONIA DIGITATA Linn.; F. I. iii. 164; F. B. I. i. 348; E. D. A. 455.
Planted here and there, especially in the western drier parts and especially near the tombs of Mussalman saints. A thick-based spreading tree. *Vernac.* Gorakh-amli. The Baobab.

103. **Bombax** Linn.

Trees; trunk armed with prickles; *leaves* digitately compound, deciduous. *Flowers* axillary or subterminal, solitary or clustered,

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appearing before the leaves. *Calyx* cupular, coriaceous, irregularly bursting into 3–7-lobes; bracteoles obsolete but calyx and peduncle marked with 2–3 scars. *Petals* 5, adnate below to staminal tube. *Stamens* numerous, connate below in a tube, dividing upwards more or less complicately into 5 usually again subdivided phalanges; ultimate filaments all with 1-celled or occasionally the series next the style with 2-celled anthers. *Ovary* 5-celled, style filiform; stigmas 5, often very minute; ovules in each cell numerous. *Fruit* a 5-valved capsule, valves woody or coriaceous, woolly within. *Seeds* globose, embedded in the woolly packing derived from the endocarp; testa thin; albumen scanty.

197. BOMBAX MALABARICUM DC.; F. B. I. i. 349. *B. heptaphyllum* F. I. iii. 167.

In all the provinces, very common.

A prickly stemmed tree with buttressed base.

Vernac. Simal. The Red Cotton-tree.

104. Eriodendron DC.

Trees; trunk armed with prickles; *leaves* digitately compound, deciduous. *Flowers* tufted at ends of branches or axillary, appearing before the leaves; bracteoles obsolete. *Calyx* cup-shaped, truncate. *Petals* 5, white. *Stamens* few, 1-seriate, united below in a tube, divided above into 5 or more thick filaments bearing 2-celled or rarely 1-celled anthers with sinuate lobes. *Ovary* ovoid, 5-locular; style cylindric, dilated, stigma obscurely 5-lobed. *Fruit* an oblong 5-valved capsule, valves coriaceous, woolly within. *Seeds* globose, embedded in the woolly packing derived from the endocarp; testa thin; albumen scanty.

198. ERIODENDRON ANFRACTUOSUM DC.; F. B. I. i. 350; E. D. E. 289. *Bombax pentandrum* F. I. iii. 165.

Planted occasionally in C. Bengal.

A tall tree with buttressed base, the green bark sparingly beset with prickles. *Beng.* Swet simal. The Kapok, or White Cotton-tree.

Order XXIV. STERCULIACEÆ.

Trees or shrubs, rarely climbing, or herbs, often stellate-haired; inner bark fibrous, wood soft, juice mucilaginous. *Leaves* alternate, simple, lobed or rarely digitately compound, when simple either penninerved or palminerved ; stipules free, rarely 0. *Flowers* regular, hermaphrodite or 1-sexual, usually in axillary or terminal cymes. *Disk* 0. *Sepals* 5, connate below rarely throughout, very rarely free ; lobes valvate. *Petals* 5 or 0, contorted in bud, free or sometimes adnate below to staminal column. *Stamens* many, connate in a column or tube, rarely few and free, often adnate below to petals ; anthers in heads or in a ring at apex of tube or scattered outside the tube or column with often intervening staminodes ; anthers 2-celled, cells parallel or diverging, rarely subconfluent at their tips ; dehiscence longitudinal, extrorse. *Carpels* rarely solitary, usually 2–5 united in a superior sessile or stalked 2–5-, rarely 10–12-locular ovary ; styles 1–5, more or less united, rarely free ; ovules few or many, axial on the inner angle, anatropous, raphe ventral or lateral. *Fruit* dry or fleshy, dehiscent or indehiscent. *Seeds* sometimes arillate ; albumen fleshy or scanty or 0 ; embryo straight or curved, with usually leafy cotyledons.

Flowers 1-sexual or polygamous ; petals 0 ; andrœcium columnar or sessile ; mature carpels discrete :—

Anthers numerous, irregularly clustered in a head or ring at apex of staminal column ; ripe carpels dehiscent ....**Sterculia.**

Anthers 5 in a ring at top of column ; ripe carpels indehiscent **Heritiera.**

Flowers hermaphrodite ; petals present ; mature carpels conjoined (only 1 carpel in *Waltheria*) :—

*Petals flat, deciduous or persistent :—[p. 273]

Petals deciduous :—

Andrœcium columnar below, dilated into a cup above ; anthers on edge of staminal cup usually alternating with staminodes ; capsules woody :—

Anther-cells divaricate or confluent ; seeds without wings **Helicteres.**

Anther-cells parallel, distinct ; seeds winged ...**Pterospermum.**

Andrœcium tubular conical, antheriferous from the middle to the top ; staminodes 0..**Eriolæna.**

Petals persistent :—

Andrœcium tubular with antheriferous margin ; anthers 15, in 5 groups of 3, the groups alternating with 5 staminodes **Pentapetes.**

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Andrœcium tubular only at base; stamens 5, without staminodes:—
  Ovary 5-celled ....**Melochia.**
  Ovary 1-celled ....**Waltheria.**

*Petals concave at the base, appendaged at the tip; andrœcium tubular; anthers marginal 1-seriate, singly or in groups alternating with staminodes:—[p. 272]
  Anthers in groups of 2–4 between each pair of staminodes:—
    Petals with a clawed ovate blade; capsule 5-winged and 5-angled, truncate at the top, valves hirsute at edges ......**Abroma.**
    Petals with a linear 2-fid blade; capsule globular, woody, tubercled ....**Guazuma.**
  Anthers solitary between each pair of staminodes; petals with a ligulate 2-fid blade; capsule prickly........................**Buettneria.**

105. Sterculia Linn.

Trees or shrubs, with simple, palmately lobed, or compound digitate leaves. *Flowers* in axillary or terminal panicles, polygamous. *Calyx* tubular, 4–5-partite, often petaloid. *Petals* 0. *Stamens* united in a column bearing a head or ring of sessile 2-celled anthers. *Ovary* sessile or stipitate, of 4–5 carpels opposite the sepals; styles connate below; stigmas free, radiating, as many as the carpels; ovules 2 or more in each carpel. *Fruit* a cluster of distinct, or (by suppression) of solitary, follicular, sessile or stipitate, membranous coriaceous or woody ripe carpels. *Seeds* 1 or more, naked or arillate, occasionally winged; albumen 2-partite, flat or folded; embryo with cotyledons sometimes thin adherent to the albumen, sometimes thick and fleshy.

Seeds without wings, few:—
  Carpels boat-shaped, woody in fruit, forming a 5-rayed star, not opening till the seeds are ripe; flowers campanulate:—
    Leaves digitate ....*fœtida.*
    Leaves simple:—
      Leaves palmately nerved and palmately lobed or cut:—
        Carpels densely covered with stiff fragile hairs; flowers ¼ in. across, ♂ fewer than ♀ ....*urens.*
        Carpels shortly tomentose with stellate hairs; flowers ½ in. across, ♂ more numerous than ♀ ....*villosa.*
      Leaves 1-nerved, not palmately lobed ....*Roxburghii.*
  Carpels spathulate, membranous, pendulous in fruit, opening long before the seeds are ripe; flowers tubular ....*colorata.*
Seeds winged along their upper end, numerous; carpels globose, woody; leaves 5-nerved at base but not lobed ....*alata.*

199. STERCULIA FŒTIDA Linn.; F. I. iii. 155; F. B. I. i. 354; E. D. S. 2824.

Planted by roadsides and near temples.

A tall tree. *Vernac.* Jangli-badám.

200. STERCULIA URENS Roxb.; F. I. iii. 145; F. B. I. i. 355; E. D. S. 2850.

Behar; Chota Nagpur.

A soft-wooded tree with papery outer bark. *Vernac.* Keonji, karaunji, telhec' (*Santal.*), guhu, bali.

201. STERCULIA VILLOSA Roxb.; F. I. iii. 153; F. B. I. i. 355; E. D. S. 2861.

Behar, Rajmahal Hills; Tippera, Comilla; Chittagong.

A white-barked tree. *Hind.* Udal; *Santal.* Gangher; *Kol.* Sisi, pironja.

202. STERCULIA ROXBURGHII Wall.; F. B. I. i. 356; E. D. S. 2841. *S. lanceæfolia* F. I. iii. 150.

Chittagong.

A tree. *Vernac.* Ushli.

203. STERCULIA COLORATA Roxb.; F. I. iii. 146; F. B. I. i. 359; E. D. S. 2819.

Chota Nagpur; Tippera; Chittagong: elsewhere planted.

A tree. *Vernac.* Samarri, pisi.

204. STERCULIA ALATA Roxb.; F. I. iii. 152; F. B. I. i. 360; E. D. S. 2806.

Chittagong; often planted in other provinces.

A tall handsome tree with buttressed base. *Vernac.* Buddha narikel.

106. **Heritiera** Ait.

Trees, with simple leathery leaves, lepidote beneath. *Flowers* small, 1-sexual, in axillary panicles. *Calyx* 5-, rarely 4–6-toothed or -cleft. *Petals* 0. *Stamens* united in a column with a ring of 2-celled anthers at the apex. *Carpels* 5–6, almost free; style short; stigmas 5, thick; ovules solitary in each carpel. *Fruit* a cluster of woody indehiscent keeled or winged ripe carpels. *Seeds* solitary; albumen 0; cotyledons fleshy, thick.

205. HERITIERA MINOR Roxb.; F. I. iii. 142. *H. Fomes* F. B. I. i. 363; E. D. H. 134.

Sundribuns.

A tree with blind rootsuckers. *Beng.* Sundri.

This is the "Sundri" whence the Sundribuns take their name. The statement is frequently made that *H. littoralis* also occurs on the Bengal coast. This apparently is not the case; at all events no one has ever been able to find it in the Sundribuns, though it has over and over again been specially hunted for. The fruits of *H. littoralis* are smooth, winged on the outer, keeled on the inner side; those of *H. minor* are smaller, somewhat corrugated, *furrowed* on the inside and less prominently winged on the outer side than those of *H. littoralis* are.

107. **Helicteres** Linn.

Trees or shrubs; *leaves* simple, pubescence stellate. *Flowers* axillary, solitary or fascicled. *Calyx* tubular, often irregular, segments 5. *Petals* 5, clawed, equal or unequal, the claws often auriculately appendaged. *Stamens* united in a column adnate to a gynophore, 5-lobed or 5-toothed at the apex; anthers 2-celled, or confluent and 1-celled, in groups at the apex of the column between the teeth. *Ovary* at the top of the column, 5-lobed, 5-locular; styles subulate, more or less united, slightly thickened at the stigmatic tips; ovules in each cell numerous. *Fruit* of straight or spirally twisted follicles. *Seeds* tubercled; albumen scanty; embryo with foliaceous cotyledons.

Ripe carpels spirally twisted ....*Isora.*
Ripe carpels not twisted ....*spicata.*

206. HELICTERES ISORA Linn,; F. I. iii. 143; F. B. I. i. 365; E. D. H. 92.
General throughout our area.
A shrub. *Beng.* Atmora; *Kol.* Sakomsang; *Hind.* Bhendu, maraphali.

207. HELICTERES SPICATA Colebr.; F. B. I. i. 366.
Chittagong.
A shrub.

108. **Pterospermum** Schreb.

Trees or shrubs; *leaves* leathery, oblique below, penninerved, simple or lobed, usually 2-farious; tomentum stellate or sometimes lepidote. *Flowers* axillary and terminal, usually showy, solitary or 2–3 together, bracteoles entire or laciniate, persistent or deciduous. *Calyx* of 5 more or less connate sepals. *Petals* 5, large, deciduous with the calyx. *Stamens* united in a short column, with 5 ligulate staminodes opposite the petals alternating with 5 groups each containing 3 linear 2-celled apiculate anthers opposite the sepals. *Ovary* within the top of the staminal column, 3–5-locular; style entire, stigma 5-grooved; ovules in each cell numerous. *Fruit* a coriaceous or woody, terete or angled, loculicidally 5-valved capsule. *Seeds* winged above, 2-seriate on the inner angles of the capsular chambers; albumen scanty or 0; embryo with plaited or crumpled cotyledons.

Capsules distinctly 5-angled; leaves large, broad ....*acerifolium.*
Capsules terete; leaves oblong-lanceolate, semi-sagittate...*semisagittatum.*

208. PTEROSPERMUM ACERIFOLIUM Willd.; F. I. iii. 158; F. B. I. i. 368; E. D. P. 1389.
Chittagong; N. Bengal: elsewhere often planted.
A large tree. *Vernac.* Kanak-chámpa.

209. PTEROSPERMUM SEMISAGITTATUM Ham.; F. I. iii. 160; F. B. I. i. 368.
Chittagong; elsewhere occasionally planted.

109. **Eriolæna** DC.

Trees; *leaves* simple or lobed; tomentum stellate. *Flowers* axillary, peduncles 1–many-flowered; bracteoles 3–5, laciniate persistent, or small caducous. *Calyx* spathaceous but ultimately 5-partite. *Petals* 5, flat, with dilated tomentose claws. *Stamens* numerous, united in a short column; anthers many-seriate, 2-celled, linear-oblong, on outside of column with no intervening staminodes. *Ovary* sessile, 5–10-locular; style erect, stigmas 5–10, spreading; ovules numerous in each loculus. *Fruit* a woody loculicidal capsule. *Seeds* winged above; albumen scanty; embryo with plaited or crumpled cotyledons.

Bracteoles deeply cut; peduncles not exceeding the leaves; valves tubercled or pitted ....*Hookeriana.*
Bracteoles entire; peduncles longer than the leaves; valves not tubercled *quinquelocularis.*

210. ERIOLÆNA HOOKERIANA W. & A.; F. B. I. i. 370; E. D. E. 314.
Chota Nagpur; Behar, on hills: often planted in other provinces.
A tree. *Vernac.* Búndún, gua-goli, gua-kasi.

211. Eriolæna quinquelocularis Wight; F. B. I. i. 371; E. D. E. 317.
Chota Nagpur, on Parasnath.
A tree.

110. **Pentapetes** Linn.

Herbs; *leaves* hastate-lanceolate. *Flowers* axillary; bracteoles 3, subulate, caducous. *Sepals* 5, lanceolate, connate only at the base. *Petals* 5. *Stamens* connate at the base, 15 fertile in 5 groups of 3, alternating with 5 staminodes that are almost as long as the petals; anthers 2-celled, extrorse. *Ovary* sessile, 5-locular; style entire, twisted and thickened upwards; ovules numerous in each loculus. *Fruit* a loculicidally 5-valved capsule. *Seeds* 8–12, 2-seriate in each chamber, without wings; embryo with 2-partite plicate cotyledons.

212. Pentapetes phœnicea Linn.; F. I. iii. 157; F. B. I. i. 371; E. D. P. 393.
Everywhere common.
A weed of waste places. *Beng.* Kát-láta, bandhuli; *Santal.* Bare baha; *Hind.* Dopoharia.

111. **Melochia** Linn.

Herbs or undershrubs with simple more or less softly pubescent leaves. *Flowers* small, in lax panicles or clusters. *Sepals* 5, connate below. *Petals* 5, marcescent. *Stamens* 5, opposite the petals, connate at the base in a tube; anthers 2-celled extrorse. *Ovary* sessile, 5-locular; styles 5, free or connate at the base; ovules 2 in each loculus. *Fruit* a loculicidally 5-valved capsule. *Seeds* ascending; albumen copious; embryo straight.

213. Melochia corchorifolia Linn.; F. I. iii. 139; F. B. I. i. 374; E. D. M. 429.
Everywhere common.
A shrubby weed of waste places. *Beng.* Tiki-okra; *Santal.* Thuiak' arak'.

112. **Waltheria** Linn.

s or undershrubs with simple leaves; stipules narrow.
mall, in dense axillary or terminal clusters. *Sepals* 5,
w. *Petals* 5. *Stamens* 5, connate below in a tube;
d. *Ovary* sessile, 1-locular; style excentric, stigma

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clavate; ovules 2 ascending. *Fruit* a 2-valved, 1-seeded capsule. *Seed* ascending; albumen copious; embryo straight.

214. WALTHERIA INDICA Linn.; F. B. I. i. 374.

Everywhere common.

A weed of waste places. *Vernac.* Khar dudhi.

113. Abroma Jacq.

Trees or shrubs; *leaves* cordate or ovate oblong, serrulate, angled or not. *Flowers* in few-flowered leaf-opposed cymes. *Sepals* 5, connate at the very base only. *Petals* 5, concave below, prolonged upwards as a cochleate lamina. *Stamens* connate in a cupular column, with 5 long staminodes opposite the sepals alternating with 5 groups containing each 2–4, usually 3, fertile filaments; anthers 2-lobed, lobes diverging. *Ovary* sessile, 5-locular and 5-lobed; styles 5; ovules numerous in each loculus. *Fruit* a membranous, 5-angled, winged, septicidally 5-valved capsule, with villous margins and truncate apex. *Seeds* numerous; albumen copious; embryo straight.

215. ABROMA AUGUSTA Linn.; F. I. iii. 156; F. B. I. i. 375; E. D. A. 41.

Sometimes planted; occasionally also as an escape.

A shrub, branches downy. *Vernac.* Ulatkambal.

114. Guazuma Plum.

Trees; *leaves* simple, tomentose. *Flowers* in axillary cymes. *Calyx* at first spathaceous, at length 5-fid. *Petals* 5, concave at the base, lamina divided above into 2 narrow strap-shaped parts. *Stamens* connate in a tubular column, with 5 staminodes opposite the sepals alternating with bundles each of usually 3 fertile stamens; anthers 2-lobed, lobes diverging. *Ovary* sessile, 5-lobed and 5-locular; styles more or less connate; ovules in each cell numerous. *Fruit* a woody, oblong, tubercled capsule. *Seeds* numerous; albumen copious; embryo curved.

216. GUAZUMA TOMENTOSA Kunth.; F. B. I. i. 375; E. D. G. 726.

Often planted by roadsides and near tanks, but also very readily self-sown.

A tree. *Beng.* Nipal tunth. The Bastard Cedar

115. Buettneria Linn.

Herbs, shrubs often climbing, or trees, frequently p simple, entire, or lobed. *Flowers* minute, in

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axillary or terminal umbellate cymes. *Sepals* 5, connate below. *Petals* 5, with concave claw and long strap-like 2-fid limb. *Stamens* connate in a membranous tubular column, with 5 staminodes opposite the sepals alternating with 5 fertile stamens opposite the petals; anthers 2-lobed, lobes extrorse. *Ovary* sessile, 5-locular; style entire or 5-fid; ovules 2 in each loculus. *Fruit* a globose, armed, septicidally 5-valved capsule, with persistent central column. *Seeds* ascending, solitary in each chamber; albumen 0; embryo with large, spirally convolute cotyledons.

Leaves glabrous, ovate-acuminate, longer than broad; a herb, capsule prickly ....*herbacea.*
Leaves puberulous or tomentose, not longer than broad:—
  Leaves puberulous, at length glabrescent, cordate-oblong, entire; a tree; capsule prickly ....*aspera.*
  Leaves pilose on both surfaces, cordate at base, margin angled or lobed; a climbing shrub; capsule bristly ....*pilosa.*

217. BUETTNERIA HERBACEA Roxb.; F. I. i. 619; F. B. I. i. 376.
Behar; Chota Nagpur; Orissa.
A herb. *Beng.* Kambraj; *Santal.* Dikku sindur.

218. BUETTNERIA ASPERA Colebr.; F. B. I. 377.
Behar, Rajmahal Hills.
A tree.

219. BUETTNERIA PILOSA Roxb.; F. I. i. 618; F. B. I. i. 377.
Chittagong.
A climbing shrub, especially in secondary jungle or on exposed ridges.

Order XXV. TILIACEÆ.

Trees, shrubs, or rarely herbs; inner bark fibrous, wood usually soft, juice often mucilaginous. *Leaves* alternate, simple, entire or toothed, rarely opposite; stipules free, often caducous. *Flowers* regular, hermaphrodite, or rarely 1-sexual, in usually corymbose few-, or panicled many-flowered cymes. *Disk* annular or 0. *Sepals* 5, rarely fewer, free or connate below, valvate in bud. *Petals* 5 or fewer or 0, imbricate or valvate. *Stamens* many, rarely few, usually inserted on the disk, filaments filiform, free or connate at base or united in 5–10 bundles; anthers 2-celled; cells parallel, rarely divaricate, and then sometimes subconfluent at their tips; dehiscence longitudinal extrorse, rarely apical porous.

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Carpels 2–5, united in a free 2–10-locular ovary; styles connate, rarely partly or quite free, or stigmas sessile and as many as loculi or connate; ovules 1 or more, if few pendulous from apex or ascending from base, if more horizontal often 2-seriate, but always from inner angle, anatropous with raphe ventral or lateral. *Fruit* fleshy or dry, indehiscent or dehiscent, sometimes by abortion 1-celled. *Seeds* 1 or more, ascending transverse or pendulous, never arillate; albumen fleshy, sometimes scanty, rarely 0; embryo usually straight, with leafy, rarely fleshy cotyledons.

Petals thin, coloured, unguiculate, entire or subentire, imbricated or twisted in bud; anthers globose or oblong, opening by slits:—
  Sepals connate below in a cup; anther-cells ultimately confluent at the top, the 5 inner stamens reduced to staminodes; carpels distinct, 2-valved .... **Brownlowia.**
  Sepals distinct:—
    Petals with a more or less adnate basal scale, inserted round base of a raised torus; stamens springing from apex of torus:—
      Fruit not prickly, drupaceous .... **Grewia.**
      Fruit prickly, small, globose, indehiscent or separating into 3–5 cocci .... **Triumfetta.**
    Petals without a basal scale, inserted directly round stamens on a contracted torus; capsule opening loculicidally, many-seeded **Corchorus.**
Petals rigid, white or sepaloid, almost always laciniate, induplicate-valvate in bud; anthers linear, opening by slits; stamens arising in groups opposite the petals and alternate with the lobes of a 5-lobed torus; sepals distinct; fruit drupaceous .... **Elæocarpus.**

116. Brownlowia Roxb.

Trees; *leaves* entire, pinnately 3–5-veined; pubescence lepidote. *Flowers* many, small, in large terminal or axillary panicles. *Calyx* campanulate, irregularly 3–5-fid. *Petals* 5, eglandular. *Stamens* numerous, rising from a raised torus, many-seriate; filaments free; anthers subglobose; the inner series replaced by 5 lanceolate petaloid staminodes opposite the petals. *Ovary* 5-locular; styles subulate, slightly connate; ovules 2 in each loculus, ascending. *Fruit* a group of at length almost discrete, 2-valved ripe carpels. *Seeds* solitary in each carpel; albumen 0; cotyledons thick, fleshy.

Leaves ovate-acute, base cordate, downy beneath; buds clavate; calyx infundibuliform velvety; filaments slender; staminodes linear; panicle as long as its adjacent leaf .... *elata.*

Leaves lanceolate-acuminate, scaly beneath; buds ovoid; calyx campanulate, scaly; filaments stout; staminodes petaloid; panicle shorter than leaves ....*lanceolata.*

220. BROWNLOWIA ELATA Roxb.; F. B. I. i. 381; E. D. B. 893. *Humea elata* F. I. ii. 640.

Chittagong.

A tall tree. *Vernac.* Mass, masjot.

221. BROWNLOWIA LANCEOLATA Benth.; F. B. I. i. 381; E. D. B. 895.

Sundribuns.

A tree. *Beng.* Bola sundri, kedar sundri.

117. **Grewia** Linn.

Trees or shrubs; *leaves* entire, usually palmately 3–9-nerved; pubescence stellate. *Flowers* usually few, in axillary, extra-axillary or terminal cymes, sometimes numerous paniculate. *Sepals* 5, free. *Petals* 5, glandular at the base, rarely 0. *Stamens* numerous, on a raised torus; staminodes 0. *Ovary* 2–4-locular; style subulate, stigma shortly lobed; locules with 2-many ovules. *Fruit* drupe-like, fleshy or fibrous, entire or 2–4-lobed; stones 4 or fewer, each 1–2-seeded with spurious dissepiments between the seeds. *Seeds* ascending; albumen fleshy, rarely 0; cotyledons flat.

Inflorescence terminal in panicled cymes; flowers involucrate; stigma slightly toothed; drupe entirely fleshy; leaves 3-nerved at base, glabrous above, glabrescent beneath ....*Microcos.*

Inflorescence in axillary clustered cymes; flowers not involucrate; stigma dilated, fringed, radiating:—

  Drupe when dry with a distinct crustaceous rind; peduncles very short, rarely as long as petioles:—

    Leaves oblong, rough with short stellate tomentum, sub-3-nerved at base; drupes small..*pilosa*

    Leaves ovate or obovate, very harshly scabrid, drupes large *sclerophylla.*

  Drupe fleshy, wrinkled when dry, without a crustaceous rind; peduncles always nearly or quite as long as, usually longer than petioles:—

    *Leaves broad, strongly 5- or, sometimes, more-nerved at base ovate-oblong, oblong, ovate or cordate:—[p. 282]

      Stipules auricled at base, falcate; leaves obliquely ovate-rhomboid, obtuse or abruptly short-pointed, almost always cordate;

hoary or only pubescent beneath; peduncles not exceeding the petioles ....*tiliæfolia.*

Stipules not auriculate at base:—

Peduncles at least twice as long as petioles, often much longer:—

Leaves ovate-oblong, apex long acute or acuminate, margin simply serrate; buds subglobose, smooth; stipules linear *excelsa.*

Leaves rounded or obovate, apex obtuse or shortly abruptly pointed, margin double-serrate; buds oblong or ovoid, ribbed:—

Leaves densely pubescent above as well as closely hoary beneath; petals notched; stipules lanceolate ...*orbiculata.*

Leaves sparsely pilose or pubescent or at length glabrescent above; petals entire:—

Stipules lanceolate; flower-buds clavate; drupes subturbinate; a small tree .. ..*asiatica.*

Stipules linear; flower-buds ovoid; drupes subglobose, faintly 4-lobed; a dwarf shrub with woody stock annually emitting herbaceous, pubescent shoots ...*sapida.*

Peduncles slightly if at all exceeding the petioles; buds globose or ovoid, smooth; leaves rounded, apex short acuminate, margin simply serrate:—

Leaves closely finely hoary beneath; stipules linear; cymes few ....*vestita.*

Leaves densely tawny-white tomentose beneath; stipules lanceolate falcate; cymes many ....*cinnamomea.*

*Leaves narrow, 3-nerved at base, lanceolate or ovate-lanceolate; drupe fleshy:—[p. 281]

Leaves nearly glabrous; drupes didymous; peduncle much longer than petiole:—

Leaves ovate-lanceolate; flowers over 1 in. across; a large shrub or small tree, leaves 4–6 in. long ....*lævigata.*

Leaves obovate-lanceolate; flowers about half an inch across; a small twiggy shrub, leaves 2–3 in. long ....*multiflora.*

Leaves hoary or pubescent; drupes globose or subglobose:—

Leaves finely pubescent above, closely hoary pubescent beneath; peduncles much longer than the petioles ....*salviæfolia.*

Leaves glabrescent above, densely tomentose but not hoary beneath; peduncles not much longer than the petioles...*hirsuta.*

222. GREWIA MICROCOS Linn. F. B. I. i. 392; E. D. G. 682. *G. ulmifolia* F. I. ii. 591.

Chittagong.
A shrub.

223. **Grewia pilosa** Lamk.; F. B. I. i. 388. – *G. carpinifolia* F. I. ii. 587.
Behar; Chota Nagpur.
A large shrub or small tree.

224. **Grewia sclerophylla** Roxb. *G. scabrophylla* F. I. ii. 584; F. B. I. i. 387; E. D. G. 708.
Chota Nagpur; Chittagong.
A small shrub with large harsh leaves.

225. **Grewia tiliæfolia** Vahl; F. I. ii. 587; F. B. I. i. 386; E. D. G. 714.
Behar; Chota Nagpur.
A medium-sized tree. *Vernac.* Dhamin, olat (*Santal.*)

226. **Grewia excelsa** Vahl; F. B. I. i. 385; E. D. G. 677. *G. salvifolia* F. I. ii. 587.
Chota Nagpur, Singhbhum; Chittagong.
A considerable shrub. *Vernac.* Kulo.

227. **Grewia orbiculata** Rottl.; F. B. I. i. 386.
Western Behar, rare.
A shrub. *Vernac.* Dhamin.

228. **Grewia asiatica** Linn.; F. I. ii. 586; F. B. I. i. 386; E. D. G. 663.
Cultivated in Tirhut, N. Bengal, Behar, Chota Nagpur, Orissa; also wild in Chota Nagpur.
A small tree. *Vernac.* Pharsa, phalsa, sukri (*Hind.*).

229. **Grewia sapida** Roxb.; F. I. ii. 590; F. B. I. i. 387.
Chota Nagpur; E. Bengal.
A small shrub sending up annual herbaceous shoots from a woody stock.

230. **Grewia vestita** Wall. *G. asiatica* var. *vestita* F. B. I. i. 317; E. D. G. 673 partly.
Behar; Chota Nagpur; Orissa.
A tree. *Vernac.* Dhamin, olat, bimla.

231. **Grewia cinnamomea** Gamble; E. D. G. 673 partly.
Chota Nagpur.
A tree. *Vernac.* Dhamin, olat.

232. **Grewia lævigata** Vahl; F. B. I. i. 389; E. D. G. 679. *G. didyma* F. I. ii. 591

Chota Nagpur ; Orissa ; Behar ; N. Bengal, Duars ; Chittagong.

A small tree or large shrub. *Hind.* Kath bimla ; *Uriya* Kaki.

233. **Grewia multiflora** Juss. ; F. B. I. i. 388 ; E. D. G. 685. *G. sepiaria* F. I. ii. 589.

N. Bengal ; in other parts usually only planted in hedges.

A small very virgate shrub. *Beng.* Pani sara.

234. **Grewia salviæfolia** Heyne ; F. B. I. i. 386 ; E. D. G. 705.

Behar, Monghyr hills ; Chota Nagpur, common ; Orissa, Khurda.

A shrub or small tree. *Uriya* Dhattika ; *Santal.* Sitanga, khorkhorendna ; *Kol.* Bursu, cheli.

235. **Grewia hirsuta** Vahl ; F. I. ii. 587 ; F. B. I. . 391.

Chota Nagpur.

A shrub.

118. **Triumfetta** Linn.

Herbs or undershrubs ; *leaves* serrate, simple or lobed ; pubescence stellate. *Flowers* small, in dense cymes. *Sepals* 5, oblong, concave. *Petals* 5. *Stamens* 5, 10, 15 or more springing from a fleshy, lobed, glandular torus. *Ovary* 2–5-locular ; style filiform, stigma 5-toothed ; ovules 2 in each loculus. *Fruit* globose or oblong, bristly or spiny, indehiscent or breaking up by 3–6 valves. *Seeds* solitary or paired in each chamber, pendulous ; albumen copious ; embryo straight.

Capsules indehiscent or nearly so, echinate, the cells usually one-seeded :—
  Fruit oblong ; leaves roundish .... *neglecta.*
  Fruit globose :—
    Leaves roundish not lobed, blunt, greyish tomentose beneath as are the sepals .... *rotundifolia.*
    Leaves irregularly lobed, acuminate sepals stellate-tomentose *rhomboidea.*

Capsules separating when ripe into 3–4 densely bristly cocci, the cells usually 2-seeded :—
  Leaves slightly hirsute ; capsules and bristles glabrous .... *annua.*
  Leaves densely tomentose beneath, pubescent above ; capsules tomentose, the bristles more or less pilose .... *pilosa.*

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236. TRIUMFETTA NEGLECTA W. & A.; F. B. I. i. 396.
Tirhut; Behar.
An annual herb.

237. TRIUMFETTA ROTUNDIFOLIA Lamk; F. B. I. i. 395.
Western Behar.
An undershrub.

238. TRIUMFETTA RHOMBOIDEA Jacq.; F. B. I. i. 395; E. D. T. 839. *T. Bartramia* F. I. ii. 463. *T. trilocularis* F. I. ii. 462.
Common everywhere.
A weedy undershrub. *Beng.* Ban-okra; *Hind.* Chikti.

239. TRIUMFETTA ANNUA Linn.; F. B. I. i. 396; E. D. T. 835.
Behar.
An annual herb. *Vernac.* Chikti.

240. TRIUMFETTA PILOSA Roth; F. B. I. i. 394; E. D. T. 837.
Behar; Chittagong.
A herb.

119. **Corchorus** Linn.

Herbs or undershrubs; *leaves* simple; pubescence stellate. *Flowers* small, yellow, 1–2 on axillary or leaf-opposed peduncles. *Sepals* 4–5. *Petals* 4–5, eglandular. *Stamens* numerous, several-seriate or rarely 2-seriate and twice as many as the petals, arising from the torus; filaments free. *Ovary* 2–6-locular; style short, stigma cupular; ovules numerous in each loculus. *Fruit* a slender elongated, rarely a stout subglobose, smooth tuberculate or prickly, loculicidally 2–5-valved capsule, occasionally with transverse dissepiments. *Seeds* numerous, pendulous or horizontal; albumen copious; embryo curved.

*Capsule elongated, beaked :—[p. 286]
  Beak of capsule 3-fid, lobes spreading; leaves without basal bristle-like lobes :—
    Capsule thick, truncated, 6-angled, the alternate angles produced into wings; stamens 15–20 .... *acutangulus.*
    Capsule rather slender, terete, not winged; stamens 5–10 ...*tridens.*
  Beak of capsule entire, erect :—
    Capsule puberulous, shortly beaked, without transverse partitions between the seeds; stamens 5–10 .... *fascicularis.*
    Capsule with transverse partitions between the seeds; stamens many :—
      †Capsules scabrous or aculeate, beak short; leaves without basal lobes [p. 286] .... *trilocularis*

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†Capsule glabrous, beak long; leaves with the lower pair of serratures prolonged as fine basal lobes [p. 285] ....*olitorius.*

*Capsule globose, not beaked, muricate; leaves with lower pair of serratures prolonged as fine basal lobes [p. 285] .... *capsularis.*

241. CORCHORUS ACUTANGULUS Lamk; F. B. I. i. 398; E. D. C. 1840. *C. fuscus* F. I. ii. 582.

A common weed everywhere.

A spreading or ascending annual herb. *Beng.* Titapat.

242. CORCHORUS TRIDENS Linn.; F. B. I. i. 398; E. D. C. 1873.

Tirhut.

An annual herb.

243. CORCHORUS FASCICULARIS Lamk; F. I. ii. 582; F. B. I. i. 398; E. D. C. 1858.

Orissa; Chota Nagpur; N. Bengal.

An annual herb. *Beng.* Jangli-pat, bilnalita.

244. CORCHORUS TRILOCULARIS Linn.; F. I. ii. 582; F. B. I. i. 397; E. D. C. 1875.

Behar; Tirhut.

An annual weed.

245. CORCHORUS OLITORIUS Linn.; F. I. ii. 581; F. B. I. i. 397; E. D. C. 1861. *C. decemangularis* F. I. ii. 582.

Cultivated everywhere.

An annual rains crop. *Beng.* Pat. Jute.

246. CORCHORUS CAPSULARIS Linn.; F. I. ii. 581; F. B. I. i. 397; E. D. C. 1846.

Cultivated everywhere.

An annual rains crop. *Beng.* Pat. Jute.

120. Elæocarpus Linn.

Trees; *leaves* simple. *Flowers* hermaphrodite or occasionally polygamous, in axillary racemes. *Sepals* 5, free. *Petals* 5, laciniate at the apex or rarely entire, attached outside the annular or 5-lobed disk. *Stamens* usually numerous, rarely 10, attached inside the disk; subaggregated in groups opposite the petals and alternating with the disk-lobes when present; anthers innate; dehiscence terminal porous. *Ovary* sessile, 2–5-locular; style columnar; ovules in each loculus numerous. *Fruit* a drupe with a single hard stone, 3–5-celled or sometimes by abortion 1-celled. *Seeds* solitary pendulous in each cell; albumen fleshy; embryo with flat cotyledons.

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- Anthers blunt, or only one anther-cell sharply produced; flowers small, petals glabrous:—
  - Ovary 5-celled; drupe 5-celled and 5-seeded, globular; stamens many; anthers bearded, one anther-cell acute, longer than the other... *Ganitrus.*
  - Ovary 3–4-celled; drupe usually 1-celled, 1-seeded, ovoid:—
    - Anthers bearded; petiole eglandular:—
      - Anthers 20; racemes about as long as leaves .... *floribundus.*
      - Anthers 40–50; racemes shorter than leaves.................. *robustus.*
    - Anthers not bearded; petiole with two minute glands at the point of junction with blade .... *lucidus.*
- Anthers cuspidate or aristate at the apex; flowers medium, petals silky:—
  - Anther-tails erect; petals narrowed towards base and dilated towards apex:—
    - Racemes as long as leaves; buds lanceolate; stamens 40–50; leaves cuneate-obovate .... *aristatus.*
    - Racemes shorter than leaves; buds conical; stamens 30; leaves obovate-oblong .... *rugosus.*
  - Anther-tails reflexed; petals wide at base and narrowed towards apex *Varunua.*

247. Elæocarpus Ganitrus Roxb.; F. I. ii. 592; F. B. I. i. 400; E. D. E. 57.

Chittagong.

A tree. Dr. Wallich received this from Chittagong, but it has not been received since. It is common in Malaya; perhaps it is only a planted tree in any part of India. *Beng.* Radrakia; *Hind.* Radrak.

248. Elæocarpus floribundus Bl.; F. B. I. i. 401.

N. Bengal; E. Bengal; Chittagong.

A tree. *Vernac.* Belphoi.

249. Elæocarpus robustus Roxb.; F. I. ii. 597; F. B. I. i. 402; E. D. E. 65.

Chittagong, common.

A tree. *Vernac.* Chekio (*Chittagong*).

250. Elæocarpus lucidus Roxb.; F. I. ii. 600; F. B. I. i. 403.

Chittagong, extremely rare.

A tree. This has only once been collected, at Burkal, by Mr. Lister, on April 1, 1876, since Dr. Roxburgh got it about 100 years ago. It is very like *E. robustus*, but the glands on the petiole and the beardless stamens very readily distinguish it.

251. ELÆOCARPUS ARISTATUS Roxb.; F. I. ii. 599; F. B. I. i. 405.
Chittagong.
A tree.

252. ELÆOCARPUS RUGOSUS Roxb.; F. I. ii. 596; F. B. I. i. 405.
Chittagong.
A tree.

253. ELÆOCARPUS VARUNUA Ham.; F. B. I. i. 407; E. D. E. 71.
Chittagong.
A tree.

Order XXVI. LINEÆ.

Herbs or shrubs, rarely trees. *Leaves* alternate, rarely opposite, simple, entire, rarely crenate-serrate; stipules lateral, interpetiolar, or 0. *Flowers* regular, hermaphrodite, usually cymose. *Disk* 0, or of 5 entire or 2-lobed glands adnate to the staminal ring. *Sepals* 5, rarely 4, imbricate, connate below or free. *Petals* 5, rarely 4, hypogynous or slightly perigynous, often contorted, usually fugacious. *Stamens* 4–5 with alternating staminodes, or 8–10 all fertile, rarely more; filaments filiform, connate below in a hypogynous or subperigynous ring; anthers versatile 2-celled; dehiscence longitudinal, lateral. *Carpels* united as a free, 3–5-celled entire ovary; styles 3–5, free or more or less connate, with terminal stigmas; ovules 1–2 in each cell attached to inner angle, anatropous, pendulous with raphe ventral. *Fruit* capsular, dehiscing septicidally into 2-valved cocci. *Seeds* compressed; albumen fleshy; embryo nearly as long as the albumen, straight or curved.

Herbs; leaves linear or lanceolate; styles 5; capsules 5-celled ...**Linum.**
Undershrubs; leaves elliptic-ovate; styles 3–4; capsules 3–4-celled **Reinwardtia.**

121. Linum Linn.

Herbs; *leaves* narrow, quite entire; stipules 0 or replaced by glands. *Sepals* 5. *Petals* 5, contorted, fugacious. *Stamens* 5, often with small alternating staminodes; disk-glands opposite the petals. *Ovary* 5-locular, each loculus 2-locellate; styles usually free, stigmas clavate or capitate; ovules 10, one in each locellus. *Fruit* a 5-celled capsule, splitting septicidally into 5 simple 2-seeded or into 10 1-seeded cocci. *Seeds* compressed; albumen scanty; embryo straight.

254. LINUM USITATISSIMUM Linn.; F. I. ii. 110; F. B. I. i. 410; E. D. L. 385.

Generally cultivated.

A cold-weather crop; flowers blue. In India cultivated only as an oil-seed. *Hind.* Chikna, alsi, tisi; *Beng.* Tisi, masína; *Uriya* Pesu.

122. Reinwardtia Dumort.

Undershrubs; *leaves* alternate, entire, or crenate-serrate; stipules subulate, small, fugacious. *Flowers* yellow, showy, in axillary and terminal cymose clusters or solitary. *Sepals* 5, acuminate. *Petals* 5, contorted, fugacious. *Stamens* 5, hypogynous, connate at the base, alternating with as many subulate staminodes; disk-glands 2–3. *Ovary* 3–5-locular; locules 2-locellate; styles 3–4, filiform, free or connate below, stigmas subcapitate; ovules in each locellus solitary. *Fruit* a globose capsule splitting into 6–8 cocci. *Seeds* reniform, solitary in each coccus.

255. REINWARDTIA TRIGYNA Planch.; F. B. I. i. 412; E. D. R. 71.

Linum trigynum F. I. ii. 110.

Behar, Rajmahal Hills; Chota Nagpur, common.

A tufted subgregarious undershrub, with large yellow flowers.

Order XXVII. MALPIGHIACEÆ.

Trees or shrubs; often climbing. *Leaves* usually opposite, entire; stipules small or 0. *Flowers* regular or irregular, hermaphrodite or sometimes polygamous; pedicels articulate, usually 2-bracteolate. *Disk* usually obscure. *Sepals* connate in a 5-partite calyx, lobes imbricate less often valvate, one or more (never all) furnished with a large gland, sometimes all eglandular. *Petals* 5, clawed or sessile, often fimbriate, imbricate. *Stamens* 10, hypogyous or subperigynous, all equal or 1 or more much exceeding the others; filaments free or connate below; anthers 2-celled short, connective sometimes thickened; dehiscence longitudinal introrse. *Carpels* usually more or less united in a 3-locular, rarely 2- or 4-locular ovary, rarely distinct; styles usually 3 distinct, occasionally connate, rarely only 1 carpel with a style or 1 with a long and 2 with short styles, stigmas small; ovules solitary in each carpel or loculus, orthotropous with long funicle and raphe ventral. *Fruit* usually of one or more winged samaras, less often (not in Indian species) drupaceous. *Seed* with usually membranous testa; albumen 0; embryo straight or more or less curved, cotyledons often unequal.

Calyx with a single large gland adnate to the pedicel; styles solitary or (rarely) 2; carpels 3-winged ....**Hiptage.**
Calyx without a gland; styles 3; carpels broadly winged all round **Aspidopterys.**

123. Hiptage Gaertn.

Shrubs, climbing or suberect; *leaves* opposite, entire, coriaceous, eglandular or with a line of intra-marginal glands below; stipules 0. *Flowers* white, fragrant, with the 5th petal coloured, in terminal or axillary racemes or panicles; peduncles bracteate; articulate pedicels 2-bracteolate. *Calyx* 5-partite, with large glands adnate to pedicel. *Petals* 5, silky, clawed, unequal. *Stamens* 10, declinate, one exceeding the rest, all fertile; filaments connate at the base. *Ovary* 3-locular, with appendiculate lobes; styles 1–2 circinate, 2–1 rudimentary, stigmas 1 or 2; ovules solitary in each loculus. *Fruit* of 1–3, 2–3-winged samaras. *Seed* subglobose; embryo with thick unequal cotyledons.

256. HIPTAGE MADABLOTA Gaertn.; F. B. I. i. 418; E. D. H. 285. *Gaertnera racemosa* F. I. ii. 368.

Behar; Chota Nagpur; Chittagong: elsewhere often planted.

A very heavy woody climber, with fragrant flowers. *Hind.* and *Beng.* Mahadeo-lata; *Beng.* Basanti; *Uriya* Baromali.

124. Aspidopterys A. Juss.

Shrubs, usually climbing; *leaves* opposite, entire, eglandular; stipules 0. *Flowers* small, white or yellow, in axillary or terminal panicles; peduncles bracteate; articulate pedicels often minutely 2-bracteolate. *Calyx* short, 5-partite, eglandular. *Petals* 5, not clawed, spreading or reflexed. *Stamens* 10, all fertile; filaments connate or free at the base. *Ovary* 3-locular, loculi flattened at the back, winged laterally; styles 3, stigmas capitate; ovules solitary. *Fruit* of 1–3 samaras, the nucleus sometimes winged or crested at the back and surrounded by a wide oblong or orbicular marginal wing. *Seeds* oblong, subterete; embryo straight with equal cotyledons.

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257. ASPIDOPTERYS ROTUNDIFOLIA A. Juss. *A. nutans* var. *rotundifolia* F. B. I. i. 421. *Hiræa rotundifolia* F. I. ii. 448.
Chittagong.
A slender climber.

Order XXVIII. ZYGOPHYLLACEÆ.

Herbs or shrubs, rarely trees, branches often articulate. *Leaves* opposite or alternate by suppression, 2-foliolate or pinnate, very rarely simple, entire, or multifid; leaflets entire, not dotted; stipules 2, persistent, occasionally spinescent. *Flowers* hermaphrodite, regular or irregular, solitary or paired, axillary, rarely 2-bracteolate. *Disk* convex or depressed, rarely annular, eglandular, sometimes 0. *Sepals* 5, occasionally 4, free or rarely connate below, imbricate or rarely valvate or open in bud. *Petals* 5 or 4, rarely 0, hypogynous, free, imbricate or contorted, rarely valvate. *Stamens* in one, less often two, rarely three whorls, each equal in number to the petals, the filaments often alternately long and short, occasionally some of them sterile, usually with a basal or median scale, those of the whorl opposite them often adnate to the bases of the petals; anthers versatile; dehiscence longitudinal lateral. *Carpels* usually 4–5, rarely fewer or more, united in a sessile or occasionally stipitate 2–12-lobed -angled or -winged and 2–12-locular ovary, the loculi sometimes partially transversely septate; style terminal, rarely subgynobasic central, angled or furrowed with angles stigmatic, or with simple discoid stigma or with stigmas 5 free; ovules 2–many, rarely 1, ascending or pendulous, raphe ventral. *Fruit* dehiscent or indehiscent, of 2–10 free or united, often spiny cocci, very rarely (*Peganum* sometimes) berry-like. *Seeds* usually pendulous, solitary, very rarely 2 or more, oblong or linear; albumen fleshy or horny but scanty, sometimes 0; embryo as long as the seed, straight or curved.

Leaves opposite, abruptly pinnate, unequal; stamens 2-seriate, all fertile; flowers pseudo-axillary..**Tribulus.**
Leaves alternate, entire or multifid; stamens 3-seriate, usually some without anthers; flowers leaf-opposed ....**Peganum.**

125. Tribulus Linn.

Prostrate herbs, diffusely branched; *leaves* opposite, usually unequal, abruptly pinnate, usually silky; stipules 2. *Flowers* solitary, white or yellow, on pseudo-axillary peduncles. *Sepals* 5. *Petals* 5, patent, caducous. *Stamens* 10, inserted at the base of a 10-lobed annular disk, alternately short and long, the 5 shorter glandular externally, the 5 longer opposite the petals; filaments filiform. *Ovary* sessile, hirsute, 5–12-locular and 5–12-lobed; style short pyramidal or filiform, stigmas 5–12; ovules solitary or 2–5 superposed in each loculus. *Fruit* 5-angled, splitting into 5–12 tubercled spinous or winged indehiscent cocci. *Seeds* solitary in each coccus, obliquely pendulous; albumen 0; embryo with ovate cotyledons.

Flowers 1–2 in. across, their peduncles as long as or longer than the leaves ....*cistoides.*
Flowers ·4–·6 in. across, their peduncles shorter than the leaves...*terrestris.*

258. TRIBULUS CISTOIDES Linn.; F. B. I. i. 423.
C. Bengal, only near Calcutta, introduced and rare.
A prostrate herb.

259. TRIBULUS TERRESTRIS Linn.; F. B. I. i. 423; E. D. T. 547.
T. lanuginosus F. I. ii. 401.
Tirhut; Behar; Chota Nagpur; Orissa.
A prostrate herb with spiny fruits. *Vernac.* Gakhuru.

126. Peganum Linn.

Perennial herbs, glabrous or pubescent; *leaves* alternate, entire or multifid; stipules 2, setaceous. *Flowers* white, solitary, on subterminal leaf-opposed peduncles. *Sepals* 4–5, sometimes leafy and pinnatifid. *Petals* 4–5, imbricate. *Stamens* 12–15, inserted at the base of the disk, usually some of them sterile; filaments dilated below. *Ovary* globose, 2–4-locular and deeply 2–3-lobed; styles subbasal, twisted, with 2–3 stigmatic ridges above; ovules in each loculus numerous on the inner angle. *Fruit* 3–4-celled, dry and splitting by 3 valves, or fleshy and indehiscent. *Seeds* in each cell numerous, angular; testa rough, spongy; albumen fleshy; embryo curved.

260. PEGANUM HARMALA Linn.; F. B. I. i. 486; E. D. P. 372.
Western Behar; W. Tirhut: very rare.
A bush 1–3 feet high. *Hind.* Harmal; *Beng.* Isband.

This genus, following the advice of Hooker in the *Flora of British India* is retransferred from *Rutaceæ* to *Zygophylleæ*. One great objection to placing *Peganum* in *Rutaceæ* is the absence of pellucid glands from its leaves.

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Order XXIX. GERANIACEÆ.

Herbs, sometimes climbing, rarely shrubs, very rarely trees. *Leaves* opposite or alternate, simple, occasionally peltate, usually dentate or lobed, or compound sometimes sensitive; stipules usually 2. *Flowers* hermaphrodite, regular or irregular, usually axillary. *Disk* inconspicuous or glandular. *Sepals* 5, rarely 4 or 2, free or connate, imbricate or rarely valvate, the upper sometimes spurred. *Petals* 3–5, or 0, hypogynous or subperigynous, imbricate, occasionally contorted. *Stamens* usually 5 1-seriate in irregular flowers, 10 or 15 2–3-seriate in regular flowers, frequently some deformed; filaments filiform or dilated, free or connate below; anthers 2–celled versatile; dehiscence longitudinal lateral. *Carpels* united in a 3–5-lobed and 3–5-celled ovary, rarely 2-lobed, produced upwards with the axis in a style-bearing beak or with styles free or only partly connate; stigmas capitate or linear; ovules 1–2, less often more in each cell, pendulous, anatropous with raphe ventral. *Fruit* capsular 3–5-lobed, rarely berry-like and indehiscent or late of dehiscence; valves often separating elastically. *Seed* often solitary, pendulous or horizontal; albumen rarely fleshy, usually scanty or 0; embryo straight or curved.

Flowers regular or subregular; sepals herbaceous, not spurred, imbricated; stamens 10:—

Glands on the torus 5, alternating with the subregular petals; capsules beaked, the valves when dehiscing rolled elastically upwards; leaves simple; herbs .... **Geranium.**

Glands on the torus 0; capsules not beaked; leaves compound:—

Fruits of loculicidally dehiscent capsules; stamens all perfect; herbs:—

Valves cohering with axis; leaves digitately compound ...**Oxalis.**

Valves detaching from axis; leaves pinnately compound **Biophytum.**

Fruits of indehiscent berries; often 5 of the stamens reduced to staminodes; leaves pinnate; trees .... **Averrhoa.**

Flowers irregular; sepals usually petaloid, the upper spurred; stamens very short, 5, with subconnate anthers:—

Lateral petals connate in pairs; fruit capsular, elastically dehiscent **Impatiens.**

Lateral petals free like upper, imbricate; fruit drupaceous, fleshy, indehiscent.. **Hydrocera.**

127. Geranium Linn.

Herbs or undershrubs; *leaves* opposite or alternate, palmately nerved; stipules 2. *Flowers* regular, on axillary bracteate 1–2-flowered or umbellate peduncles. *Sepals* 5. *Petals* 5, hypogynous, imbricate, alternating with 5 glands. *Stamens* 10, all fertile, or alternately 5 fertile, 5 imperfect, free or shortly connate below. *Ovary* 5-locular and 5-lobed, beaked; styles 5, stigmas longitudinal; ovules 2 superposed in each loculus. *Fruit* a 5-lobed, 5-celled capsule, with a solitary seed in each cell; carpels usually ventrally splitting and often separating septifragally from the axis, their beaks coiling elastically upwards. *Seeds* with albumen scanty or 0; embryo with incumbent induplicate or convolute cotyledons.

261. GERANIUM OCELLATUM Camb.; F. B. I. i. 433; E. D. G. 180.
Behar, Parasnath.

A small straggling herb; flowers rose-coloured with a purple eye. *Hind.* Bhánda.

128. Oxalis Linn.

Herbs, rarely undershrubs, with acid juice; *leaves* radical or alternate, ternately digitate, often subsensitive; stipules 2 or 0. *Flowers* regular, on axillary 1- or more-flowered peduncles. *Sepals* 5. *Petals* 5, hypogynous, contorted; disk without glands. *Stamens* 10, all fertile, free or slightly connate at the base. *Ovary* 5-locular and 5-lobed; styles 5, stigmas terminal, capitate or 2-fid or laciniate; ovules 1 or more in each loculus. *Fruit* a loculicidally dehiscent capsule with persistent valves. *Seeds* with an elastically opening outer coat and a crustaceous testa; albumen fleshy; embryo straight.

262. OXALIS CORNICULATA Linn.; F. I. ii. 457; F. B. I. i. 436; E. D. O. 547. *O. pusilla* F. I. ii. 457.

Common everywhere by roadsides and, especially, in cultivated ground.

A small "shamrock" with yellow flowers. *Hind.* Ambóti, chalmori; *Beng.* Amrul, chuka-tripati; *Santal.* Tandi chatom arak'.

129. Biophytum DC.

Annual or sometimes perennial herbs or undershrubs, simple or branched; *leaves* usually sensitive, compound, even-pinnate, fascicled at top of stem or branches; leaflets opposite, oblique; stipules minute or 0. *Flowers* small, umbellate on terminal peduncles. *Sepals* 5. *Petals* 5, hypogynous, contorted; disk without glands. *Stamens* 10, those of the outer series smaller, all fertile, free. *Ovary* 5-locular and 5-lobed; styles 5; stigmas terminal, 2-fid or notched; ovules several in each loculus. *Fruit* a loculicidally dehiscent capsule with spreading persistent valves. *Seeds* with an elastically opening outer coat and a crustaceous testa; albumen fleshy; embryo straight.

Sepals exceeding the capsules; pedicels not as long as the flowers:—
  Leaflets in 10–14 pairs; pedicels distinct; seeds with transverse tubercled ridges ....*sensitivum.*
  Leaflets in 5–7 pairs; pedicels very short or 0; seeds simply tubercled *Apodiscias.*
Sepals not exceeding the capsules; pedicels as long as flowers or longer; leaflets 10–20 pairs; seeds spirally furrowed ....*Reinwardtii.*

263. BIOPHYTUM SENSITIVUM DC.; F. B. I. i. 436. *Oxalis sensitiva* F. I. ii. 457.

Very common everywhere on roadsides and in cultivated ground.

A small herb with a spreading crown of sensitive leaves. *Hind.* Lak-chana.

264. BIOPHYTUM APODISCIAS Turcz.; F. B. I. i. 437.

Behar, Monghyr.

A herb very like, but rather smaller than, the preceding.

265. BIOPHYTUM REINWARDTII Walp.; F. B. I. i. 437.

Chota Nagpur, common; Behar; N. Bengal; Chittagong.

Very similar to *B. sensitivum.*

130. **Averrhoa** Linn.

Trees; *leaves* alternate, compound, odd-pinnate, leaflets subopposite; stipules 0. *Flowers* small, regular, in panicled cymes in leaf-axils or on old wood. *Sepals* 5. *Petals* 5, contorted; disk without glands. *Stamens* 10, all perfect or 5 sterile, somewhat connate below. *Ovary* 5-locular and 5-lobed, beakless; styles 5, free, stigmas capitate; ovules in each cell numerous. *Fruit* oblong, 5-lobed, fleshy, indehiscent. *Seeds* with or without an arillus; albumen fleshy but scanty; embryo straight.

Fruits sharply angled; seeds arillate ....*Carambola.*
Fruits bluntly angled; seeds without arillus ....*Bilimbi.*

266. AVERRHOA CARAMBOLA Linn.; F. I. ii. 450; F. B. I. i. 439; E. D. A. 1646.

Planted rather frequently everywhere; occasionally also self-sown.

A tree with sensitive leaves. *Hind.* Karmal; *Beng.* Kamarak.

267. AVERRHOA BILIMBI Linn.; F. I. ii. 451; F. B. I. i. 439; E. D. A. 1644.

Planted everywhere; and often occurring self-sown.

A tree. *Vernac.* Bilimbi.

131. **Impatiens** Linn.

Herbs, rarely shrubby below; *leaves* simple, opposite or alternate, occasionally whorled, sometimes all radical; stipules 0 or represented by glands at base of petiole. *Flowers* irregular, resupinate, solitary, few or many, on scapes or on axillary or terminal peduncles. *Sepals* 3, rarely 5, imbricate, the 2 anterior when present minute, the 2 lateral small flat usually herbaceous, the posterior (by torsion placed in front of the flower) large petaloid and spurred or saccate. *Petals* 3 or 5, anterior outmost in bud large, lateral 2-lobed or (if the petals be viewed as normally 5) of 2 connate petals. *Disk* 0. *Stamens* 5; filaments short broad; anthers connivent, usually connate. *Ovary* oblong, 5-locular; stigma sessile 5-toothed; ovules numerous 1-seriate in each loculus. *Fruit* a 5-valved loculicidal capsule, the valves separating elastically from the axis. *Seeds* tubercled or smooth, hairy or glabrous; albumen 0; embryo straight.

268. IMPATIENS BALSAMINA Linn.; F. I. i. 651; F. B. I. i. 454.

Chota Nagpur, very common near police outposts and villages, but also now extending far into the forests.

A herb. *Hind.* Gul-mendi; *Beng.* Dúpati; *Uriya* Haragaura.

132. **Hydrocera** Bl.

Herbs, erect, aquatic; *leaves* alternate narrow; stipules 0. *Flowers* irregular, on short axillary 1–2-flowered peduncles. *Sepals* 5, petaloid, imbricate; the 2 lateral outer flat, the posterior spurred. *Petals* 5, anterior outmost in bud large, concave; disk 0. *Stamens* 5; filaments short broad; anthers connate. *Ovary* 5-locular; stigmas 5, sessile; ovules 2–3 in each loculus. *Fruit* drupaceous indehiscent, with a bony truncate 5-celled stone. *Seeds* in each cell solitary, curved, corrugated; albumen 0; embryo with rather thick cotyledons.

269. HYDROCERA TRIFLORA W. & A.; F. B. I. i. 483. *Impatiens natans* F. I. i. 652.

E. Bengal, Faridpur.

An annual water weed with fistular floating stems emitting roots at the nodes. *Beng.* Domuti.

Order XXX. RUTACEÆ.

Trees or shrubs, sometimes climbing, rarely herbs. *Leaves* abundantly gland-dotted, opposite or alternate, usually compound; stipules 0. *Flowers* usually hermaphrodite and regular, in axillary or terminal simple or panicled cymes, rarely racemose. *Disk* annular, crenate or lobed, sometimes considerably elongated. *Sepals* 4–5, almost always imbricate, free or connate. *Petals* 4–5, hypogynous, rarely subperigynous, free, imbricate or valvate. *Stamens* 4–5 or 8–10, rarely more; filaments usually free, hypogynous, inserted outside the disk; anthers 2-celled, usually versatile; dehiscence longitudinal, introrse. *Carpels* 4–5, free or connate in a superior ovary; styles as many, free or more or less connate, stigmas terminal, entire or lobed; ovules usually 2 in each cell, sometimes numerous, superposed on the inner angle, raphe ventral. *Fruit* of 1–4 dehiscent cocci, or a capsule, or indehiscent and drupaceous or berry-like and then often large. *Seeds* usually solitary in the cells; albumen fleshy or 0; embryo straight or curved.

Flowers usually polygamous or monœcious; carpels 2-ovuled:—
  Ovary deeply 2–5-lobed, styles basilar ventral, more or less free; carpels dehiscent; stamens 3–5; flowers polygamous; leaves 3- or more-foliolate; stem prickly .... **Zanthoxylum.**
  Ovary entire, style simple; carpels syncarpous indehiscent; leaves 1–3-foliolate:—
    Stem prickly; flowers monœcious; petals and stamens each 2–5 **Toddalia.**
    Stem unarmed; flowers polygamous; petals 4, stamens 8 **Acronychia.**
Flowers usually hermaphrodite; ovary entire; style simple; fruit indehiscent:—

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Style short persistent; ovules solitary in each cell; leaves 1-foliolate to pinnate .... **Glycosmis.**

Style articulate at top of ovary, deciduous :—

Ovules 1–2 in each loculus; stamens 10 or fewer :—

Unarmed plants; leaves pinnate with leaflets alternate :—

Petals imbricate; cotyledons fleshy plano-convex :—

Filaments dilated below, stamens 8–10 .... **Clausena.**

Filaments linear-subulate, stamens 10 .... **Murraya.**

Petals valvate; cotyledons leafy corrugated; filaments linear-subulate, stamens 10.. **Micromelum.**

Armed plants; leaves pinnate or 3-foliolate with leaflets opposite, or 1-foliolate :—

Leaves 3–9-, sometimes more-foliolate, leaflets opposite :—

Calyx distinctly lobed :—

Calyx 3-lobed; stamens 6; leaflets always 3 ...**Triphasia.**

Calyx 4–5-lobed; stamens 8 or 10; leaflets 5 or more, rarely 3 .... **Limonia.**

Calyx cupular with entire or obscurely 4–6-toothed margin; stamens 8 or 10; leaflets always 3 .... **Luvunga.**

Leaves 1-foliolate :—

Anthers linear-oblong, stamens 8–10; disk elongate **Paramignya.**

Anthers ovate-cordate, stamens 5–8; disk cup-shaped **Atalantia.**

Ovules more than 2 in each loculus; stamens 10 or more; armed trees with large fruits :—

Stamens 10–12; ovary incompletely 5–6-locular; leaves pinnate; rind of fruit woody; flowers polygamous .... **Feronia.**

Stamens 20–60; ovary usually many-locular; flowers hermaphrodite :—

Leaves 3-foliolate; stamens 30–60; ovary 8- or more-locular; rind of fruit woody .... **Ægle.**

Leaves 1-foliolate; stamens 20–60; ovary many-celled; rind of fruit leathery.. **Citrus.**

133. Zanthoxylum Linn.

Shrubs or trees, usually armed with stout prickles; *leaves* alternate, 3-foliolate or imparipinnate; leaflets usually opposite, entire or crenate, often oblique; stipules 0. *Flowers* small, in axillary or terminal peduncled cymes, often 1-sexual. *Calyx* 3–8-fid, rarely absent. *Petals* 3–5, rarely absent, imbricate or induplicate-valvate. *Stamens* 3–5, hypogynous, or reduced to scales in flowers; disk small or obsolete. *Ovary* in ♂ flower rudimentary, in ⚥ or ♀ flowers of 1–5 oblique 1-locular carpels; styles sublateral, free or connate above, stigmas capitate; ovules 2 in each loculus, usually collateral. *Fruit* of 1–5 globose, coriaceous or fleshy, 1-seeded carpels dehiscing by the ventral suture; endocarp hard, separating or not. *Seed* oblong or compressed or globose, often pendent by a longish funicle; testa shining hard; albumen fleshy; embryo straight.

270. Zanthoxylum Budrunga Wall.; F. B. I. i. 495; E. D. Z. 23. *Fagara Budrunga* F. I. i. 417.

Chittagong.

A tree armed with prickles; leaves pinnate; leaflets with large glands in the crenatures of the blade. *Vernac.* Badrang.

134. Toddalia Juss.

Shrubs, usually scandent, stems prickly; *leaves* alternate, 1–3-foliolate, petioles prickly; leaflets sessile; stipules 0. *Flowers* small, 1-sexual, in axillary or terminal cymes or panicles. *Calyx* short, 2–5-lobed or -partite. *Petals* 2–5, imbricate or valvate. *Stamens* in ♂ flowers 2, 4, 5, or if 8 with alternately fertile and sterile filaments, inserted at the base of a distinct or obsolete disk. *Ovary* in ♂ flower rudimentary or 4-lobed, in ♀ flower oblong or globose, 2–7- (rarely 1-) locular; style short or 0, stigma capitate; ovules 2, either superposed or collateral in each cell. *Fruit* subglobose or lobed, coriaceous or fleshy, indehiscent, 2–7-celled; cells 1-, rarely 2-seeded. *Seeds* angular, reniform; testa coriaceous; albumen fleshy; embryo curved.

271. Toddalia aculeata Pers.; F. B. I. i. 497; E. D. T. 489. *Scopolia aculeata* F. I. i. 616.

Orissa.

A rambling prickly sarmentose shrub. *Vernac.* Kada-todali.

135. Acronychia Forst.

Trees, unarmed; *leaves* opposite or alternate, 1-, rarely 3-foliolate; leaflets entire; stipules 0. *Flowers* medium or small, polygamous, in axillary and terminal corymbs. *Calyx* 4-lobed, lobes imbricate, sometimes accrescent. *Petals* 4, valvate, revolutely spreading. *Stamens* 8, inserted below a thick 8-angled hirsute disk; filaments alternately longer and shorter. *Ovary* 4-locular, tomentose, inserted in hollow of disk; style terminal, stigma 4-furrowed; ovules 2 superposed in each loculus. *Fruit* indehiscent drupaceous, or dehiscent loculicidally valved, 4-celled. *Seeds* 1–2 in each cell, often pendulous from the funicle; testa hard; albumen fleshy; embryo straight.

272. ACRONYCHIA LAURIFOLIA Bl.; F. B. I. i. 498.
Chittagong.
A small tree or large shrub.

136. **Glycosmis** Corr.

Shrubs, rarely trees, unarmed; *leaves* 1-foliolate or imparipinnate; leaflets alternate; stipules 0. *Flowers* small, in axillary, rarely terminal panicles. *Calyx* 4–5-partite; lobes broad, imbricate. *Petals* 4–5, imbricate. *Stamens* 8 or 10, free, inserted outside the disk; filaments dilated below; anthers small, often with a gland at back or tip. *Ovary* 2–5-locular; style very short, persistent, stigma capitate; ovules solitary, pendulous in each loculus. *Fruit* small, dry or fleshy, 1–3-seeded, berry-like. *Seeds* oblong, testa membranous; albumen 0; embryo with thick equal cotyledons.

Ovary connate at base with disk; leaflets usually 3 ....*pentaphylla*.
Ovary constricted at base and free from disk; leaflets usually 5
pentaphylla var. *nitida*.

273. GLYCOSMIS PENTAPHYLLA Corr.; F. B. I. i. 499; E. D. G. 271. *Limonia pentaphylla* F. I. ii. 381.
Very common in thickets near villages, everywhere.
A low shrub. *Hind.* Ban-nimbu; *Beng.* Ashhoura.

273/2. Var. NITIDA. *G. pentaphylla* var. 2, sub-var. 4, F. B. I. i. 500.
Chittagong.

137. **Clausena** Burm.

Shrubs or trees, unarmed; *leaves* imparipinnate, leaflets membranous, alternate; stipules 0. *Flowers* small, in terminal or axillary cymes racemes or panicles. *Calyx* 4–5-lobed or -partite. *Petals* 4–5, free, membranous, imbricate. *Stamens* 8 or 10, inserted outside an elongated disk; filaments alternately shorter and longer, dilated or arched and concave below the narrow tip. *Ovary* stipitate, 4–5-, rarely 2- or 3-locular; style usually distinct, deciduous, stigma obtuse, entire or lobed; ovules 2, collateral or superposed in each loculus. *Fruit* small, oblong or globose, berry-like, 2–5-celled. *Seeds* 1–2 in each cell, oblong; testa membranous; albumen 0; embryo with large equal cotyledons.

Panicle terminal:—
  Ovary glabrous; inflorescence and leaves glabrous; leaflets 5–9 (usually 7), hardly oblique; flowers usually 4-, rarely 5-merous *heptaphylla*.
  Ovary hirsute or pubescent; leaflets oblique:—
    Leaves and inflorescence more or less pubescent; leaflets 15–30; flowers 4-merous; ovary 4-celled ....*excavata*.
    Leaves and inflorescence pustular; leaflets 5–9; flowers 4–5-merous; ovary usually 5-celled ....*Wampi*.
Racemes axillary; all parts softly pilose; ovary glabrous; flowers 4-merous; leaflets 5–17 ....*suffruticosa*.

274. CLAUSENA HEPTAPHYLLA W. & A.; F. B. I. i. 504. *Amyris heptaphylla* F. I. ii. 248.
C. and E. Bengal; Chittagong.
A branching bush. *Beng.* Karan-phal.

275. CLAUSENA EXCAVATA Burm.; F. B. I. i. 504. *Amyris sumatrana* F. I. ii. 250. *A. punctata* F. I. ii. 251.
Chittagong; Chota Nagpur, Singbhum.
A somewhat fœtid tree.

276. CLAUSENA WAMPI Blanco; F. B. I. i. 505. *Cookia punctata* F. I. ii. 382.
Chota Nagpur, planted.
A small glabrous tree. *Vernac.* Wangpi (*from the Chinese name*).

277. CLAUSENA SUFFRUTICOSA W. & A.; F. B. I. i. 506. *Amyris suffruticosa* F. I. ii. 250.
Chittagong.
A shrub.

138. **Murraya** Linn.

Shrubs or small trees, unarmed; *leaves* imparipinnate; leaflets alternate, petiolulate, base oblique or cuneate; stipules 0. *Flowers* solitary axillary, or in axillary cymes or terminal corymbs. *Calyx* 5-fid to -partite. *Petals* 5, imbricate, free. *Stamens* 10, inserted outside an elongated disk, alternately shorter and longer. *Ovary* 2–5-locular, narrowed upwards into the long deciduous style

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stigma capitate; ovules 1, or 2 superposed or collateral in each loculus. *Fruit* 1–2-celled, 1–2-seeded, oblong or ovoid, berry-like. *Seed* woolly or glabrous; albumen 0; cotyledons large equal.

Petals ·5 in. long; leaflets 3–8; a bush ....*exotica*.
Petals ·2 in. long; leaflets 10–20; a tree ....*Koenigii*.

278. MURRAYA EXOTICA Linn.; F. I. ii. 374; F. B. I. i. 502; E. D. M. 797.
Chota Nagpur; Behar.
A bush, or sometimes subarboreous. *Beng.* Kamini; *Hind.* Marchula.

279. MURRAYA KOENIGII Spreng.; F. B. I. i. 503; E. D. M. 800. *Bergera Koenigii* F. I. ii. 375.
Chota Nagpur; Behar; Bengal.
A small spreading tree. *Beng.* Barsanga; *Hind.* Barsanga, kathním.

139. **Micromelum** Bl.

Trees, unarmed; *leaves* imparipinnate; leaflets alternate, oblique; stipules 0. *Flowers* in large terminal flat panicles. *Calyx* cup-shaped, 3–5-toothed or -lobed. *Petals* 5, free, thick, valvate or subvalvate. *Stamens* 10, free, inserted round the disk; filaments linear, alternately shorter and longer. *Ovary* 5-, rarely 2–6-locular; style constricted at the base, deciduous, stigma capitate or obtuse; ovules 2, superposed in each loculus. *Fruit* small, dry, with spirally twisted septa, usually 1–2-seeded. *Seeds* oblong; testa membranous; albumen 0; cotyledons leafy, corrugate.

280. MICROMELUM PUBESCENS Bl.; F. B. I. i. 501. *Bergera integerrima* F. I. ii. 376.
Chittagong; E. Bengal, Dacca; N. Bengal, Dinajpur; Chota Nagpur, Singbhum.
A small spreading tree. *Vernac.* Ban-kunch.

140. **Triphasia** Lour.

Shrubs, armed with strongish straight spines; *leaves* alternate, sessile, 3-foliolate; leaflets obtuse, crenate, lateral opposite smaller; stipules 0. *Flowers* solitary or in 3-flowered axillary cymes. *Calyx* 3-lobed. *Petals* 3, free, imbricate, odorous. *Stamens* 6, inserted round the fleshy disk, free; filaments dilated below. *Ovary* ovoid, 3-locular, narrowed into the slender deciduous style, stigma obtuse or capitate, 3-lobed; ovules solitary in each cell. *Fruit* small, fleshy, ovoid, berry-like, 1–3-celled and 1–3-seeded. *Seeds* oblong, embedded in mucilage; testa coriaceous; albumen 0; embryo with often unequal or lobed cotyledons.

281. Triphasia Auriantiola Lour. *T. trifoliata* F. B. I. i. 507; E. D. T. 631.

In gardens in all the provinces.

A glabrous spiny shrub; apparently introduced to India from China. *Vernac.* Chini Narangi.

141. **Limonia** Linn.

Shrubs or small trees, often armed with spines; *leaves* alternate, 3-foliolate or imparipinnate; leaflets usually opposite, petiole winged; stipules 0. *Flowers* in fascicles racemes or panicles. *Calyx* 4–5-lobed or -partite. *Petals* 4–5, imbricate. *Stamens* 8 or 10, inserted outside the disk; filaments subulate; anthers cordate or linear-oblong. *Ovary* 4–5-locular, oblong; style short, stout, deciduous, stigma capitate or obtuse; ovules 1–2 in each cell. *Fruit* globose, indehiscent, berry-like, 1–4-celled and 1–4-seeded. *Seeds* embedded in mucilage; albumen 0; cotyledons fleshy.

282. Limonia acidissima Linn.; F. B. I. i. 507; E. D. L. 362. *L. crenulata* F. I. ii. 381.

Behar; Chota Nagpur.

A small glabrous spiny tree. *Hind.* Beli, belsian (*Chota Nagpur*); *Uriya* Bhenba.

142. **Luvunga** Ham.

Shrubs, climbing, armed with axillary spines; *leaves* 3-foliolate; leaflets coriaceous, entire; stipules 0. *Flowers* in axillary fascicled racemes or panicles. *Calyx* cupular, mouth entire or obscurely 4–6-toothed. *Petals* 4–5, free, thick, imbricate. *Stamens* 8 or 10, inserted outside the disk; filaments equal or alternately shorter and longer, free or sometimes connate, nearly throughout, in a tube. *Ovary* 2–4-locular; style stout deciduous, stigma capitate; ovules 2 superposed in each loculus. *Fruit* large, ellipsoid, berry-like, with a thick leathery rind. *Seeds* 2–3, large, ovoid; testa membranous, nerved; albumen 0; cotyledons fleshy, equal.

283. Luvunga scandens Ham.; F. B. I. i. 509. *Limonia scandens* F. I. ii. 380.
Tippera; Chittagong.
A large glabrous climbing shrub. *Vernac.* Luvunga-lata.

143. **Paramignya** Wight.

Shrubs, erect or climbing, armed with axillary spines or unarmed; *leaves* 1-foliolate but often the articulation obscure, entire, subcoriaceous, evergreen; stipules 0. *Flowers* rather large, axillary, solitary or fascicled. *Calyx* cup-shaped, or small and 4–5-lobed. *Petals* 4–5, free, imbricate or rarely valvate. *Stamens* 8 or 10, inserted round the columnar disk; filaments free, subequal; anthers linear-oblong. *Ovary* 3–5-locular; style long, deciduous, stigma capitate; ovules solitary, or 2 obliquely superposed in each loculus. *Fruit* ovoid or subglobose, berry-like, often contracted at the base, rind coriaceous. *Seeds* 1–5, large, oblong, much compressed; testa membranous; albumen 0; cotyledons fleshy, equal.

284. Paramignya citrifolia Hook. f.; F. B. I. i. 510. *Limonia citrifolia* F. I. ii. 379.
Chittagong.
A branching, rigid, spiny shrub.

144. **Atalantia** Corr.

Shrubs or trees, armed or unarmed; *leaves* alternate, 1-foliolate, coriaceous, evergreen, entire or crenulate; stipules 0, though stipule-like scales belonging to undeveloped buds may occur at the base of the petioles and spines. *Flowers* in axillary fascicles, rarely solitary, or in axillary rarely terminal corymbs or panicles. *Calyx* 3–5-lobed or -partite, sometimes splitting irregularly. *Petals* 3–5, free, or adnate to stamens and united with them in a tube; imbricate. *Stamens* 6 or 8, rarely 15–20, inserted outside the disk; filaments subequal or alternately shorter and longer, free or irregularly connate; anthers short, cordate at base. *Ovary* usually 2- or 4-locular, rarely 3- or 5-locular; style stout, deciduous, stigma capitate; ovules solitary or 2 collateral in each cell. *Fruit* large subglobose, berry-like, with thick leathery rind, 1–5-celled and 1–5-seeded. *Seeds* oblong, large; albumen 0; embryo with fleshy cotyledons.

285. Atalantia monophylla Corr.; F. B. I. i. 511; E. D. A. 1601. *Limonia monophylla* F. I. ii. 378.

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Behar; Orissa.

A small tree, with usually stout axillary spines. *Uriya* Narguni.

145. Feronia Gaertn.

A tree, armed with spines; *leaves* alternate, imparipinnate; leaflets opposite subsessile entire, petiole winged or not; stipules 0. *Flowers* polygamous, in terminal or lateral loose panicles or racemes. *Calyx* small, flat, 5-toothed, deciduous. *Petals* 5, rarely 4–6, imbricate, spreading. *Stamens* 10 or 12 a few sometimes imperfect, inserted round the disk; filaments dilated below with villous margins and face, narrow at apex. *Ovary* oblong, 5–6-locular, at length 1-locular; style 0, stigma oblong, fusiform, deciduous; ovules numerous, many-seriate, crowded on the at length parietal placentas. *Fruit* large, globose, 1-celled, many-seeded, with rough woody rind. *Seeds* embedded in pulp, oblong, compressed; albumen 0; embryo with thick fleshy cotyledons.

286. FERONIA ELEPHANTUM Corr.; F. I. ii. 411; F. B. I. i. 516; E. D. F. 53.

W. Bengal; Behar; Chota Nagpur.

A small deciduous spiny tree. *Hind.* and *Beng.* Kath-bél; *Uriya* Koeta; *Santal.* Kainta. The Wood-Apple, or Elephant-Apple.

146. Ægle Corr.

Trees, armed with spines; *leaves* alternate, 3-foliolate; leaflets membranous, subcrenulate; stipules 0. *Flowers* large, white, in axillary panicles. *Calyx* small, 4–5-toothed, deciduous. *Petals* 4–5, imbricate, spreading. *Stamens* numerous (30–60), inserted outside the minute disk; filaments free, short, subulate. *Ovary* ovoid, 8–20-locular, loculi peripheral round a thick axis; style short; stigma capitate or oblong or fusiform, deciduous; ovules numerous, 2-seriate in each loculus. *Fruit* large, globose ovoid or reniform, 8–15-celled; cells many-seeded; rind hard woody. *Seeds* oblong, compressed, embedded in acid pulp; testa mucilaginous and woolly; albumen 0; embryo with thick fleshy cotyledons.

287. ÆGLE MARMELOS Corr.; F. I. ii. 579; F. B. I. i. 516; E. D. A. 534.

Common everywhere.

A small deciduous spiny tree. *Hind.* Bél, siri-phal; *Beng.* Bél, vilva. The Bael-Fruit.

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147. Citrus Linn.

Shrubs or trees, usually armed with spines; *leaves* alternate, 1-foliolate, coriaceous, evergreen, petiole usually winged; stipules 0. *Flowers* axillary, solitary or in small cymes or panicles. *Calyx* cupular or urceolate, 3–5-fid. *Petals* 4–8, linear-oblong, thick, imbricate. *Stamens* numerous (20–60), inserted outside the large disk; filaments irregularly polyadelphous below, bundles compressed at the base. *Ovary* many-locular; style stout, deciduous, stigma capitate; ovules 4–8, 2-seriate in each loculus. *Fruit* large, oblong or globose, berry-like, fleshy, many-celled, with membranous septa; cells few-seeded and filled with transverse fusiform fleshy cells. *Seeds* horizontal or pendulous; testa coriaceous or membranous; albumen 0; embryo with large fleshy cotyledons.

Young shoots glabrous; leaflet glabrous:—
  Twigs purple; flowers pinkish, often 1-sexual; fruit with usually thick skin and mamillate; juice subacid (*typica*) or very acid:—
    Leaflet ovate; petiole distinct, margined or winged; fruit medium *medica* var. *Limonum*.
    Leaflet elliptic-oblong; petiole very short, linear or slightly winged; fruit small ....*medica* var. *acida*.
  Twigs greenish-white; flowers white, always hermaphrodite; petiole usually broadly winged; fruit medium, with usually thin skin and not mamillate ....*Aurantium*.
Young shoots and nerves of leaves beneath pubescent; flowers white and fruits large ....*decumana*.

288. Citrus medica Linn.; F. B. I. i. 514; E. D. C. 1270. Var. typica. *C. medica*, F. I. iii. 392 partly.
Cultivated very sparingly.
A small tree. *Beng.* Beg-pura; *Hind.* Bijaura. The Citron.

288/2. Var. Limonum F. B. I. i. 515; E. D. C. 1286. *C. medica* F. I. iii. 392 partly.
Cultivated not infrequently.
A small tree. *Beng.* Karna-nimbu. The Lemon.

288/3. Var. acida Brandis; F. B. I. i. 515; E. D. C. 1296. *C. acida* F. I. iii. 390.
Cultivated extensively in numerous forms, the two chief being the *Pati-nimbu*, or "common round Lime" and

the *Kaggi-nimbu*, or "long small Lime"; the latter is especially used.

A bush. *Beng.* Nimbu. The Indian Lime.

289. CITRUS AURANTIUM Linn.; F. I. iii. 392; F. B. I. i. 515; E. D. C. 1232.

Cultivated, but only thrives well in the western parts.

A small tree. The Bengali name seems to show that the earliest knowledge the natives of Bengal possessed of the Orange was derived from the kingdom of Comilla to the east and not from Upper India. *Beng.* Kamila-nimbu; *Hind.* Narangi. The Orange.

290. CITRUS DECUMANA Linn.; F. I. iii. 393; F. B. I. i. 516; E. D. C. 1263.

Cultivated very largely.

A tree. The Bengali name here again indicates pretty clearly that the first knowledge of the fruit in our area was derived from the Malay Islands. *Beng.* Batavi-nimbu. The Shaddock.

Order XXXI. SIMARUBEÆ.

Trees or shrubs, bark almost always bitter. *Leaves* alternate, pinnately compound, rarely simple, often very large; stipules deciduous or 0. *Flowers* regular, small, 1-sexual or polygamous, rarely hermaphrodite, axillary. *Disk* annular or elongated, simple or lobed, rarely 0. *Sepals* united in a 3–5-lobed calyx, lobes valvate or imbricate. *Petals* 3–5, very rarely 0, hypogynous, valvate or imbricate. *Stamens* as many or twice as many as petals, rarely numerous; filaments inserted at base of disk, free, often with a basal scale; anthers 2-celled; dehiscence longitudinal introrse. *Carpels* united in a superior, usually deeply lobed rarely smooth, 1–6-celled ovary; styles 2–5, free or more or less united, stigmas capitate; ovules from the inner angle, usually solitary in each cell rarely more, anatropous with raphe ventral. *Fruit* usually of 2–6 separating indehiscent carpels, occasionally samaroid, or dehiscent capsular, sometimes indehiscent drupaceous. *Seed* usually solitary, erect or pendulous; albumen fleshy, rarely scanty or 0; embryo straight or curved.

*Leaves unequally pinnate; calyx 5-fid; ovary deeply lobed; fruit of 1–5 samaras; a lofty unarmed tree [p. 308]............................**Ailanthus.**

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*Leaves 2-foliolate; calyx 5-partite; ovary entire; fruit a large fleshy, oily, 1-seeded drupe; a small spiny tree [p. 307] ....**Balanites.**

148. **Ailanthus** Desf.

Tall trees; *leaves* very large, alternate, imparipinnate. *Flowers* small, polygamous, in terminal or axillary panicles. *Calyx* 5-fid; lobes equal, imbricate. *Petals* 5, valvate; disk 10-lobed. *Stamens* in ♂ flowers 10, in ☿ flowers 2–3; filaments short or filiform, scales 0. *Ovary* 2–5-partite and 2–5-locular; styles connate; ovules solitary in each loculus, semianatropous. *Fruit* of 1–5 single-seeded samaras; wing very large, membranous. *Seed* pendulous; albumen scanty; embryo with leafy cotyledons.

291. AILANTHUS EXCELSA Roxb.; F. I. ii. 450; F. B. I. i. 518; E. D. A. 658.

Behar, rare; Chota Nagpur, common; Orissa.

A tree 60–80 feet high; flowers in lax, often much-branched panicles. *Hind.* Mahárukha, ghorkaram; *Uriya* Mahaním, gormi-kawat.

149. **Balanites** Del.

Shrubs or trees, armed with spines; *leaves* coriaceous, 2-foliolate; leaflets entire. *Flowers* small, green, in axillary cymes. *Calyx*-segments 5, imbricate, deciduous. *Petals* 5, imbricate; disk thick, entire or faintly lobed. *Stamens* 10, inserted outside the disk; filaments filiform. *Ovary* globose, entire, 1-locular; style short, subulate; stigmas minute, free or united; ovule solitary pendulous. *Fruit* a large fleshy oily 1-seeded drupe. *Seed* pendulous; albumen 0; embryo with thick oblong corrugate or lobed cotyledons.

292. BALANITES ROXBURGHII Planch.; F. B. I. i. 522; E. D. B. 13. *Ximenia ægyptiaca* F. I. ii. 253.

Behar.

A small spiny tree, 20 feet high; flowers in small axillary cymes. *Hind.* and *Beng.* Hingan.

Order XXXII. OCHNACEÆ.

Trees or shrubs, juice watery. *Leaves* alternate, simple, rarely pinnately compound; stipules 2, free. *Flowers* regular, hermaphrodite, bracteate, often showy, in terminal panicles or umbels

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or in axillary umbels or fascicles, rarely axillary solitary. *Disk* 0, or of a prolongation of torus often enlarged after flowering. *Sepals* 4–5, free, imbricate, persisting. *Petals* 5, rarely 4 or 10, free, hypogynous, imbricate, deciduous. *Stamens* 4–5 or 8–10 or many; filaments inserted on the disk when present, persistent; anthers basifixed deciduous; dehiscence longitudinal lateral or apical porous. *Carpels* united in a superior ovary, short and 2-locular, or elongated and 2–10-locular with placentas axial, occasionally 1-locular with placantas parietal or intruded; style subulate acute simple, rarely lobed at apex, stigma terminal; ovules in each cell 1–2, or many in each cell or on each placenta, ascending or rarely pendulous, raphe ventral. *Fruit* indehiscent, drupaceous or berry-like, compound, each pyrene 1–4-seeded, or a dehiscent 1–5-celled septicidal capsule. *Seeds* solitary or few, less often numerous; albumen fleshy or 0; embryo usually straight.

150. **Ochna** Linn.

Trees or shrubs; *leaves* alternate, simple, almost always serrate; stipules 2. *Flowers* conspicuous, yellow, bracteate, in panicles or umbels. *Sepals* 5, subpetaloid, persistent. *Petals* 5–10, deciduous; disk thick, lobed. *Stamens* numerous, shorter than the petals; filaments short or long, persisting; anthers deciduous. *Ovary* deeply 3–10-sulcate, 3–10-locular; styles connate below or throughout; stigmas simple or capitellate; ovules solitary in each cell, from the inner angle. *Fruit* consisting of 3–10 drupes seated on the broad disk. *Seed* erect; albumen 0; embryo with thick fleshy cotyledons.

Leaves finely serrate; flowers ·75 in. across, in axillary racemes; a tree *squarrosa*.
Leaves larger coarsely toothed; flowers 1·35 in. across, umbellate; a dwarf shrub ....*pumila*

293. Ochna squarrosa Linn.; F. I. ii. 643; F. B. I. i. 523; E. D. O. 1.
Orissa.
A medium tree. *Uriya* Koniari.

294. Ochna pumila Ham.; F. B. I. i. 524; E. D. O. 2.
Behar; Chota Nagpur, rather common.
A low shrub. *Santal.* Champa baha.

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Order XXXIII. BURSERACEÆ.

Trees or shrubs with balsaminous juice. *Leaves* alternate, very rarely opposite, unequally pinnate or 3-foliolate, rarely 1-foliolate; stipules, or lowest stipule-like leaflets, foliaceous, or 0. *Flowers* regular, hermaphrodite polygamous or subdiœcious, small, in racemes or panicles. *Disk* usually conspicuous, annular or cup-like, free or adnate to base of calyx. *Sepals* united in a 3–6-lobed often minute calyx; lobes imbricate or valvate. *Petals* 3–6, free or rarely connate, imbricate or valvate. *Stamens* as many or twice as many as petals, inserted below or on the disk; filaments equal or not, free rarely connate at the base; anthers versatile, rarely adnate, 2-locular; dehiscence longitudinal lateral. *Carpels* united in a superior 2–5-locular 3-gonous or globose ovary with axial placentas; ovules 2 rarely 1 in each loculus always from inner angle, usually attached above middle of cell or pendulous collateral, rarely ascending from base, anatropous with raphe ventral. *Fruit* indehiscent drupaceous with 3–5-pyrenes, rarely dehiscent pseudocapsular. *Seeds* solitary, pendulous, with membranous testa; albumen 0; embryo with usually membranous complicate rarely with fleshy cotyledons.

Drupes trigonous, valvately dehiscent, pyrenes separating ...**Boswellia.**
Drupes globose or ovoid, indehiscent, pyrenes not separating:—
  Calyx 5-fid urceolate, the tube clothed by the disk ....**Garuga.**
  Calyx 4–6-lobed imbricate, disk annular ....**Bursera.**

151. Boswellia Roxb.

Tall trees, with balsaminous juice and papery bark; *leaves* alternate, deciduous, with opposite usually serrate leaflets; stipules 0. *Flowers* hermaphrodite, small, white, in axillary racemes or panicles. *Calyx* small, 5-toothed, persistent. *Petals* 5, distinct, narrowed below, imbricate. *Stamens* 10, alternately longer and shorter, inserted at the base of the disk. *Ovary* sessile, 3-locular; style short, stigma 3-lobed; ovules 2 pendulous in each loculus. *Fruit* a 3-gonous drupe containing 3 ultimately separating 1-seeded pyrenes. *Seeds* compressed, pendulous; albumen 0; embryo with contorted multifid cotyledons.

295. BOSWELLIA SERRATA Roxb.; F. B. I. i. 528; E. D. B. 771.
B. thurifera F. I. ii. 383.
Behar; Chota Nagpur.
A balsamiferous tree. *Vernac.* Salhe, sali, saleya.

152. **Garuga** Roxb.

Trees, with pubescent young branches; *leaves* alternate, imparipinnate, crowded near ends of branches; leaflets opposite, crenulate; stipules 0. *Flowers* polygamous, in much-branched panicles. *Calyx* campanulate, 5-fid, valvate, lined by the large disk. *Petals* 5, attached to calyx-tube, induplicate-valvate. *Stamens* 10, equal, 2-seriate, attached to calyx-tube at margin of disk; filaments hairy below. *Ovary* sessile, 4–5-locular; style erect, stigma capitate, 4–5-lobed; ovules 2 in each loculus. *Fruit* a globose fleshy drupe with 1–5 pyrenes, each 1-seeded. *Seed* with a membranous testa; albumen 0; embryo with contorted cotyledons.

296. GARUGA PINNATA Roxb.; F. I. ii. 400; F. B. I. i. 528; E. D. G. 143.

Chota Nagpur; Chittagong.

A tree reaching 40 feet in height. *Beng.* Júm, tínn, kharpat, nil bhadi; *Hind.* Ghogar, kaikar; *Uriya* Mohi *Kol.* Nia jowa.

153. **Bursera** Linn.

Trees with balsaminous juice; *leaves* alternate, imparipinnate rarely 1-foliolate; stipules 0. *Flowers* hermaphrodite or polygamous, in short branched panicles. *Calyx* small, 4–6-toothed or -partite; teeth imbricate. *Petals* 4–6, short, spreading or alternately reflexed, usually valvate; disk annular crenulate. *Stamens* 8–12, nearly equal, inserted at base of disk. *Ovary* free, ovoid or subglobose, 3–5-locular; style very short, stigma 3–5-lobed; ovules 2 in each loculus. *Fruit* a globose or ovoid drupe with 3–5 1-seeded pyrenes. *Seeds* with membranous testa; albumen 0; embryo with contorted, usually 3-fid cotyledons.

297. BURSERA SERRATA Colebr.; F. B. I. i. 530; E. D. B. 941. *Limonia pentagyna* F. I. ii. 382.

Chota Nagpur; Orissa; Chittagong.

A balsamiferous tree. *Vernac.* Chitrika.

Order XXXIV. MELIACEÆ.

Trees or shrubs. *Leaves* alternate, pinnately compound, rarely 2-pinnate, very rarely simple; leaflets generally oblique at the base; stipules 0. *Flowers* regular, hermaphrodite or polygamo-diœcious, usually in axillary panicles. *Disk* tubular or annular, free or adnate to the ovary, or obsolete. *Sepals* united in a 3–6-lobed or sometimes entire calyx, rarely free, usually imbricate in bud. *Petals* 3–6, free or rarely connate below, sometimes adnate below to staminal tube, valvate imbricate or contorted. *Stamens* 4–12; filaments connate in a tube or rarely free, inserted below the base of the hypogynous disk; anthers erect, usually sessile on the tube, 2-celled, included or exserted; dehiscence longitudinal introrse. *Carpels* united in a usually superior 3–5-locular ovary; style simple, stigma disciform or capitate; ovules 2, rarely more, collateral or superposed, very rarely solitary, from inner angle, raphe ventral. *Fruit* dehiscent or indehiscent, capsular drupaceous or berry-like. *Seeds* sometimes arillate, sometimes winged, without albumen or with albumen fleshy; embryo usually flattish.

*Stamens connate in a tube:—[p. 313]
†Seeds not winged:—[p. 313]
Leaflets coarsely serrate, rarely entire; fruit a drupe; seeds with fleshy albumen and thin cotyledons; ovules in each cell 1–2:—
Flower elongated; calyx 5-partite; petals imbricate; style long; disk annular; fruit with a single 1–5-celled stone ....**Melia.**
Flower globose; calyx 5-toothed; petals valvate; style rather short; disk cupshaped; fruit containing 5 horny pyrenes ......**Cipadessa.**
Leaflets entire; seeds with no albumen and fleshy cotyledons:—
‡Ovules 1–2 in each cell; fruit either a capsule or a berry; seed arillate:—[p. 313]
Fruit a capsule, dehiscence loculicidal:—
Flowers and staminal tube oblong or linear; style long:—
Anthers linear; disk short annular; ovules solitary in each cell of the ovary ....**Chisocheton.**
Anthers short; disk cylindric longer than ovary; ovules 2 in each cell of the ovary ....**Dysoxylum.**
Flowers and staminal tube globose or turbinate; style short or 0:—
Anthers included; filaments quite united; petals 3 **Amoora.**
Anthers exserted; filaments free towards apex; petals 4–5 **Heynea.**
Fruit a berry, indehiscent; petals 5:—
Anthers included; style 0 ....**Aglaia.**
Anthers exserted; style distinct ....**Walsura.***

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* Usually the filaments in *Walsura* are connate, in two or three species (including the only species found within our area) they are free.

‡Ovules 3–8 in each cell; fruit a large capsule; seeds large thick tessaroid, without wings; arillus 0 [p. 312] .... **Carapa.**

†Seeds winged:—[p. 312]

Disk present; petals spreading; staminal tube wide:—

Petals oblong; staminal tube urceolate; disk narrow annular; seeds albuminous, wide-winged only at upper end ...... **Swietenia.**

Petals obovate; staminal tube cupular; disk rather wide; seeds without albumen, winged at both ends........................ **Soymida.**

Disk 0; petals oblong, suberect; staminal tube cylindric; seeds without albumen, winged only below .... **Chickrassia.**

*Stamens free; seeds winged; ovules 8–12 in each cell of ovary:—[p. 312]

Fruit capsular, the valves separating from the axis:—

Petals oblong, erect; stamens 4–6, with at times alternating staminodes; ovary 5-celled, cells 8–12-ovuled; seeds with albumen, winged at both ends or only below .... **Cedrela.**

Petals clawed, spreading; stamens 10; ovary 3-celled, cells 8-ovuled; seeds without albumen, with angular margins and winged above only .... **Chloroxylon.**

Fruit a berry, indehiscent; ovary 2-celled...................... **Walsura.***

154. **Melia** Linn.

Trees; *leaves* pinnately or 2–3-pinnately compound; leaflets entire or toothed, often stellately pubescent; stipules 0. *Flowers* in axillary panicles. *Calyx* short, imbricately 5–6-lobed. *Petals* 5–6, free, patent, imbricate; disk annular. *Stamens* united in a cylindric tube dilated below and above, 10–12-striate and toothed; anthers 10 or 12, included or partly exserted, short, attached near top of tube. *Ovary* 3–6-locular; style slender nearly as long as staminal tube, stigma capitate; ovules in each loculus 2 superposed. *Fruit* a fleshy drupe with a 1–5-celled stone. *Seeds* solitary, pendulous in each cell; albumen fleshy but scanty; embryo with leafy cotyledons.

Leaves twice or thrice pinnate; flowers lilac; ovary 5-celled; stone with 5 or fewer chambers and seeds.. *Azedarach.*

Leaves simply pinnate; flowers white; ovary 3-celled; stone 1-chambered and 1-seeded.. *Azadirachta.*

298. MELIA AZEDARACH Linn.; F. I. ii. 395; F. B. I. i. 544; E. D. M. 393.

Planted.

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* See footnote on opposite page.

A tree. *Beng.* Gora ním, mahaním; *Hind.* Bakain, deikna. The Persian Lilac.

299. MELIA AZADIRACHTA Linn.; F. I. ii. 394; F. B. I. i. 544; E. D. M. 363.

Planted and spontaneous in all the provinces.

A tree with dark wood and bitter leaves and bark. *Beng.* and *Hind.* Ním. The Margosa or Neem.

155. **Cipadessa** Bl.

Shrubs or small trees; *leaves* imparipinnate; leaflets opposite or nearly so, serrate or entire; stipules 0. *Flowers* subglobose, in axillary peduncled panicles. *Calyx* small, cupular, 5-toothed. *Petals* 5, oblong, rather short, free, spreading, valvate. *Stamens* connate in a deeply 10-lobed tube, adnate below to the cupshaped disk, lobes linear 2-fid at the tip; anthers 10 short subapiculate, inserted between the lobes. *Ovary* 5-locular, the cells alternate with calyx-lobes; style rather short, stigma clavate-capitate; ovules in each cell 2, collateral, pendulous. *Fruit* a 5-ribbed, 5-celled, hardly fleshy drupe. *Seeds* 1–2 in each cell; albumen fleshy; embryo with leafy cotyledons.

300. CIPADESSA FRUTICOSA Bl.; F. B. I. i. 545. *Ekebergia indica* F. I. ii. 392.

Chota Nagpur; Orissa.

A much-branched shrub.

156. **Chisocheton** Bl.

Trees or shrubs; *leaves* imparipinnate, opposite or subopposite; leaflets more or less oblique; stipules 0. *Flowers* polygamous, numerous, occasionally in spicate racemes, usually in divaricately branched supra-axillary or rarely axillary panicles. *Calyx* small, cupular, 4–5-toothed. *Petals* 4–5, rarely 6, connate below, linear above, valvate or subvalvate. *Stamens* connate in an elongated slender tube 4–8-lobed at the tip, lobes entire or toothed; anthers linear, as many as and alternate with the lobes, included or slightly exserted; disk short. *Ovary* depressed, 2–4-locular; style filiform usually exceeding the staminal tube, stigma capitate; ovules usually solitary in each loculus. *Fruit* a subglobose 2–4-celled, loculicidally 2–4-valved capsule; valves coriaceous. *Seeds* usually enclosed in a partial arillus; albumen 0; embryo with peltate cotyledons.

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Flowers on slender pedicels; leaflets hispid-pubescent on the nerves beneath; staminal tube more or less pubescent on both sides *paniculatus.*
Flowers almost sessile; leaflets quite glabrous; staminal tube glabrous *dysoxylifolius.*

301. Chisocheton paniculatus Hiern; F. B. I. i. 552. *Guarea paniculata* F. I. ii. 242.
Chittagong.
A tree. *Vernac.* Kalikora.

302. Chisocheton dysoxylifolius Kurz; F. B. I. i. 551.
Chittagong.
A tree.

157. **Dysoxylum** Bl.

Trees; *leaves* pinnate; leaflets entire, opposite or alternate, oblique, coriaceous; stipules 0. *Flowers* hermaphrodite, panicled. *Calyx* caducous, subentire or 4–5-toothed or -lobed. *Petals* 4–5, oblong, spreading, valvate or slightly imbricate. *Stamens* connate in a cylindric tube with a crenate or dentate apex; anthers short, 6 or 8 or 10, included or half-exserted; disk tubular as long as or longer than the ovary. *Ovary* usually 3–4-locular; style as long as staminal tube, stigma broadly capitate; ovules usually 2 in each cell. *Fruit* a globose or pyriform 1–4-celled loculicidal capsule; valves coriaceous. *Seeds* with or without an arillus; testa coriaceous; albumen 0; embryo with very large superposed or collateral cotyledons.

Leaves pale; calyx cup-shaped, subentire, half as long as corolla; disk glabrous within puberulous outside; staminal tube mealy outside and inside..*binectariferum.*
Leaves darker; calyx small campanulate, irregularly 4–5-toothed, much shorter than corolla; disk densely hairy at apex and inside; staminal tube quite glabrous ....*procerum.*

303. Dysoxylum binectariferum Hook. f.; F. B. I. i. 546; E. D. d. 884. *Guarea binectarifera* F. I. ii. 240.
Chittagong.
A tree 30–40 feet high. *Vernac.* Rata.

304. Dysoxylum procerum Hiern; F. B. I. i. 547; E. D. d. 889.
Chittagong.
A very tall tree. *Vernac.* Dingori.

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158. **Amoora** Roxb.

Trees; *leaves* imparipinnate; leaflets oblique, quite entire, coriaceous; stipules 0. *Flowers* polygamous or polygamo-diœcious; ♂ flowers paniculate, ♀ spicate or racemose. *Calyx* 3- (rarely 5-) fid or -partite. *Petals* 3. *Stamens* connate in a subglobose or campanulate inconspicuously 6-lobed tube; anthers 6, included; disk obsolete. *Ovary* short, sessile, 3-locular; stigma sessile; locules 1–2-ovuled. *Fruit* a subglobose, coriaceous, loculicidally 3-valved capsule. *Seeds* with a fleshy bright arillus; testa coriaceous; albumen 0; embryo with conferruminate cotyledons.

Flowers subsessile spicate; male spikes branched, female simple; calyx 5-partite; fruit 1·5 in. across..*Rohituka*.

Flowers pedicelled; male in many-fld. branching panicles, female in few-fld. racemes; calyx 3-lobed or 3-toothed:—

Leaflets alternate or subalternate, not more than 6; ovary 2-celled; fruit obovoid 2-celled, under 1 in. across; racemes much shorter than leaves..*Chittagonga*.

Leaflets opposite or subopposite, often as many as 12; ovary 3-celled; fruit subglobose 3-celled, 2·5 in. across; racemes about as long as leaves ....*cucullata*.

305. AMOORA ROHITUKA W. & A.; F. B. I. i. 559; E. D. A. 988.
Andersonia Rohituka F. I. ii. 213.

Chota Nagpur; N. Bengal; Chittagong: also often planted in the other provinces.

A medium tree with wide-spreading crown. *Hind.* Harin-hara; *Beng.* Tikta-raj; *Kol.* Sikru.

306. AMOORA CHITTAGONGA Hiern; F. B. I. i. 559.

Chittagong.

A considerable tree.

307. AMOORA CUCULLATA Roxb.; F. B. I. i. 560; E. D. A. 983.
Andersonia cucullata F. I. ii. 212.

Sundribuns, abundant.

A large tree with numerous vertical blind rootsuckers. *Beng.* Amúr, latmi.

159. **Heynea** Roxb.

Trees or rarely shrubs; *leaves* imparipinnate; leaflets 5–11, opposite, entire; stipules 0. *Flowers* hermaphrodite, small, in long-peduncled terminal and axillary panicles. *Calyx* short, 4–5-fid,

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lobes imbricate. *Petals* 4–5, oblong, suberect, subimbricate. *Stamens* connate in an 8-fid or 10-fid tube, lobes linear 2-toothed at the tip; anthers 8 or 10 attached between the lobes; disk annular. *Ovary* sunk in the disk, 2–3-locular, narrowed upwards into a short style; stigma 2–3-toothed with a thickened base; ovules 2 in each loculus. *Fruit* a 1-celled 2-valved capsule. *Seed* solitary, with a thin white arillus; albumen 0; embryo with hemispherical cotyledons.

308. HEYNEA TRIJUGA Roxb.; F. I. ii. 390; F. B. I. i. 565.
Chota Nagpur; Tirhut.
A considerable tree. *Vernac.* Kapia kushi, chenenji.

160. **Aglaia** Lour.

Trees or shrubs; *leaves* pinnate or 3-foliolate; leaflets entire; pubescence often lepidote or stellate; stipules 0. *Flowers* polygamous, minute or small, subglobose, in dense or lax panicles. *Calyx* 5-lobed; lobes imbricate. *Petals* 5, short, concave, imbricate. *Stamens* connate in an urceolate or subglobose tube, 5-toothed or entire at the apex; anthers 5, erect, included or half-exserted; disk obscure. *Ovary* subovoid, 1–3-locular; style very short, stigma simple or lobed, clavate or capitate; ovules 2 or 1 in each loculus. *Fruit* indehiscent, berry-like, 1–2-celled and 1–2-seeded. *Seed* with a fleshy testa; albumen 0; embryo with fleshy cotyledons.

Leaflets usually 5, rarely 7 or 3, pale green ………………*Roxburghiana.*
Leaflets 11–13, bright green ………………………………*perviridis.*

309. AGLAIA ROXBURGHIANA Miq.; F. B. I. i. 555; E. D. A. 644.
Chota Nagpur; W. Bengal, Midnapur; Orissa.
A medium tree. *Vernac.* Priyangu.

310. AGLAIA PERVIRIDIS Hiern; F. B. I. i. 556.
Chittagong.
A medium tree.

161. **Walsura** Roxb.

Trees; *leaves* imparipinnate, sometimes 1-foliolate; leaflets opposite, quite entire; stipules 0. *Flowers* small, hermaphrodite, in axillary and terminal panicles. *Calyx* short, 5-fid or 5-partite; lobes imbricate. *Petals* 5, oblong, spreading, slightly imbricate or subvalvate. *Stamens* 8 or 10, free linear or subulate, or connate

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in a tube; anthers terminal or inserted in a notch at the apex of the filament; disk usually annular. *Ovary* short, 2–3-locular, sunk in the disk; style short, stigma turbinate, 2–3-toothed; ovules 2 in each loculus. *Fruit* indehiscent berry-like, 1-, rarely 2-celled, and 1–2-seeded. *Seed* enclosed in a fleshy arillus; albumen 0; embryo with thick cotyledons.

311. WALSURA ROBUSTA Roxb.; F. I. ii. 386; F. B. I. i. 565; E. D. W. 19.
Chittagong.
A large timber tree. *Vernac.* Upphing.

162. Carapa Aubl.

Trees, always littoral; *leaves* equally pinnate; leaflets 1–2-, sometimes 3-jugate, opposite, entire; stipules 0. *Flowers* hermaphrodite, in lax axillary panicles. *Calyx* short, 4-fid. *Petals* 4, reflexed, contorted. *Stamens* connate in a subglobose tube 8-toothed at the apex, the teeth 2-partite; anthers 8, alternate with the teeth, included; disk cupular, adnate to base of ovary. *Ovary* 4-grooved, 4-locular; style short, stigma discoid; ovules 2–8 in each loculus. *Fruit* a very large globose 6–12-seeded capsule, the 4 coriaceous valves opening opposite the obliterated dissepiments. *Seeds* large, thick, compressed, irregularly angular; testa hard; arillus 0; albumen 0; embryo with amygdaloid cotyledons.

312. CARAPA OBOVATA Bl. *Carapa moluccensis* F. B. I. i. 567 in part; E. D. C. 482. *Xylocarpus Granatum* F. I. ii. 240.
Sundribuns, common.
A small tree, with a large spherical fruit. *Beng.* Dhundul, poohár.

163. Swietenia Linn.

Lofty trees; *leaves* even-pinnate; leaflets opposite, deciduous; stipules 0. *Flowers* hermaphrodite, small, in axillary and subterminal panicles. *Calyx* small, 5-fid, lobes imbricate. *Petals* 5, spreading, contorted. *Stamens* connate in an urceolate 10-toothed tube; anthers 10, apiculate, attached between the teeth; disk annular. *Ovary* sessile, ovoid, 5-locular; style short, stigma discoid, 5-lobed; ovules in each loculus numerous, on the inner angle. *Fruit* a 5-locular capsule septifragally dehiscent from the base, the 5 valves 2-lamellate, the outer thickly the inner thinly woody, separating from the subpersistent 5-angled woody axis. *Seeds* numerous, pendulous, 2-seriate, with compressed bodies below and long wide imbricating wings above; albumen fleshy; embryo transverse.

Leaflets 1·5 in. long or less; capsule 4 in. long or less ....*Mahagoni.*
Leaflets 3 in. long or more; capsule 7 in. long or longer ...*macrophylla.*

313. SWIETENIA MAHAGONI Linn.; F. B. I. i. 540.
Planted generally.
A very large tree; flowers freely but fruits very sparingly. Native of W. Indies and Honduras. *Vernac.* Mahagni (*from the English name*). The Mahogany.

314. SWIETENIA MACROPHYLLA King.
Planted very generally.
A medium tree; flowers and fruits very freely. Native of Honduras. *Vernac.* Bara mahagni.

164. **Soymida** A. Juss.

Lofty trees; *leaves* even-pinnate; leaflets opposite, entire, obtuse; stipules 0. *Flowers* small, in axillary and terminal panicles. *Sepals* 5, free, short, imbricate. *Petals* 5, spreading, obovate, clawed, imbricate. *Stamens* connate in a short cupular tube 10-cleft at the apex, the lobes 2-toothed; anthers 10, inserted between the teeth; disk flat. *Ovary* 5-locular; style short, stigma broad fleshy; ovules pendulous, 2-seriate, about 12 in each loculus. *Fruit* a 5-valved, woody, septifragal capsule; valves 2-lamellate, separating from the 5-winged axis. *Seeds* numerous, flattened, winged at both ends; albumen fleshy; embryo with foliaceous cotyledons.

315. SOYMIDA FEBRIFUGA A. Juss.; F. B. I. i. 567; E. D. S. 2501.
Swietenia febrifuga F. I. ii, 398.
Chota Nagpur, common.
A large timber tree. *Vernac.* Rohun.

165. **Chickrassia** A. Juss.

Lofty trees; *leaves* even-pinnate; leaflets subopposite, entire, acuminate, oblique; stipules 0. *Flowers* hermaphrodite, in terminal panicles. *Calyx* short, 5-toothed. *Petals* 5, oblong, free, contorted, suberect. *Stamens* connate in a cylindric tube, 10-crenate at the apex; anthers 10, attached within the crenatures; disk obsolete. *Ovary* shortly stipitate, usually 5-locular; style stout, stigma capitate; ovules many, 2-seriate in each loculus. *Fruit* a 3-celled, septicidally 3-valved capsule; valves 2-lamellate, separating from the 3-winged axis. *Seeds* many, flattened, winged at the lower end; albumen 0; embryo with orbicular cotyledons.

316. CHICKRASSIA TABULARIS A. Juss.; F. B. I. i. 568; E. D. C. 1021. *Swietenia Chickrassia* F. I. ii. 399.

Tippera; Chittagong.

A tall timber tree. *Beng.* Chikrass, pabba, dalmara. Chittagong-wood.

166. **Cedrela** Linn.

Lofty trees; *leaves* imparipinnate; leaflets many-jugate, opposite or subopposite, entire or serrate; stipules 0. *Flowers* white, in terminal or subterminal panicles. *Calyx* short, 5-fid. *Petals* 5, oval, suberect, free, imbricate. *Stamens* 4–6, usually 5, free, inserted on a 4–6-lobed raised disk, sometimes with alternating staminodes; filaments subulate; anthers versatile. *Ovary* sessile on the disk, 5-locular; style filiform, stigma discoid; cells with each 8–12 pendulous, 2-seriate ovules. *Fruit* a coriaceous 5-celled, septifragally 5-valved capsule; valves each 2-lamellate. *Seeds* compressed, winged below or at both ends; albumen fleshy; embryo with flat, subfoliaceous cotyledons.

Leaves usually 7-jugately pinnate; panicles glabrous; sepals ovate, acute; capsule subglobose, valves woody; seeds evenly winged at both ends ....*Toona*.
Leaves usually 9-jugately pinnate, petiole long; panicles puberulous; sepals orbicular; capsule ellipsoid, valves thin; seeds acute-winged below, with a longer obtuse wing above ... .*microcarpa*.

317. CEDRELA TOONA Roxb.; F. I. i. 635; F. B. I. i. 568; E. D. C. 838.

Fairly general, though in the central parts only a planted species.

A tall timber tree. *Hind.* and *Beng.* Tún; *Uriya* Maha limbu; *Kol.* Kahangai.

318. CEDRELA MICROCARPA C. DC.

Chittagong; Tippera.

A tall timber tree. *Vernac.* Tún; kujya.

167. Chloroxylon DC.

Medium trees; *leaves* even-pinnate; leaflets obtuse, oblique, entire. *Flowers* small, in axillary and terminal pubescent panicles. *Calyx* deeply 5-lobed. *Petals* 5, spreading, clawed, imbricate. *Stamens* 10, free, inserted between the lobes of the thick 10-lobed pubescent disk; filaments subulate, alternately shorter and longer; anthers versatile. *Ovary* pubescent, sunk in the disk, 3-lobed and 3-locular; style short slender glabrous, stigma capitate; ovules about 8, 2-seriate in each cell. *Fruit* a leathery, 3-celled, loculicidally 3-valved capsule. *Seeds* compressed with angular margins, winged above; albumen 0; embryo with thick cotyledons.

319. CHLOROXYLON SWIETENIA DC.; F. B. I. i. 569; E. D. C. 1031.
Swietenia Chloroxylon F. I. ii. 400.
Chota Nagpur.
A medium to large tree. *Vernac.* Behru, girya; *Kol.* Sengel sali. Indian Satin-Wood.

Order XXXV. CHAILLETIACEÆ.

Trees or shrubs. *Leaves* alternate, entire, simple; stipules 2, deciduous. *Flowers* regular or irregular, 1-sexual or polygamous, rarely hermaphrodite, in corymbose cymes; peduncles sometimes adnate to petiole. *Disk* of 5 glands or scales, or cupular with 5 glands or lobes. *Sepals* 5, free or connate, sometimes unequal, imbricate. *Petals* 5, free, subperigynous, equal or unequal, notched or 2-fid, blade often with an inflexed plate adnate to its face, usually open in bud. *Stamens* 5, subperigynous, all or only some fertile; filaments free or adnate to petals; anthers oblong, connective often thickened behind; dehiscence longitudinal, introrse. *Carpels* connate as a superior 2–3-locular pubescent ovary; styles 1–3, free or more or less connate, stigmas simple capitate; ovules in collateral pairs, pendulous from apex of each loculus, anatropous with raphe ventral. *Fruit* pubescent, drupaceous, oblong or compressed or didymous; epicarp sometimes dehiscent; stone usually indehiscent 1–3-chambered, chambers 1-seeded. *Seeds* pendulous, with membranous testa and broad hilum; albumen 0; embryo large with thick cotyledons.

168. Chailletia DC.

Trees or shrubs; *leaves* alternate, entire; stipules 2, deciduous. *Flowers* small, polygamo-monœcious, in corymbose cymes. *Sepals* 5, unequal, obtuse, connate at least at the base. *Petals* 5, 2-lobed, narrow, free. *Disk* of 5 quadrate antipetalous scales. *Stamens* 5, sometimes slightly adnate at the base to the petals. *Ovary* 2–3-locular; styles 2–3, subconnate or free, stigmas capitate; ovules in each cell 2, pendulous from the top. *Fruit* a 2-celled subdidymous drupe with a 2-celled stone, or 1-celled with a 1-celled stone. *Seeds* solitary in each cell, pendulous; testa membranous; albumen 0; embryo with thick cotyledons.

320. CHAILLETIA GELONIOIDES Hook. f.; F. B. I. i. 570.
Moacurra gelonioides F. I. ii. 70.
Chittagong.
A small tree. *Beng.* Moacurra.

Order XXXVI. OLACINEÆ.

Trees or shrubs, rarely herbs, sometimes climbing. *Leaves* alternate, rarely opposite, simple or lobed, penni- or palminerved; stipules 0. *Flowers* regular, hermaphrodite, or 1-sexual often diœcious, cymose. *Disk* hypogynous, or cupular perigynous or epigynous. *Sepals* 4–5, usually small, connate in a toothed calyx or free, sometimes accrescent, sometimes adnate to ovary or fruit, valvate or imbricate. *Petals* 3–6, free or more or less connate, valvate or imbricate. *Stamens* 3–15; filaments inserted with the petals, free or adnate to them and either opposite to or alternate with them, all fertile or some without anthers, or connate; anthers erect, 2-celled; dehiscence longitudinal introrse. *Carpels* united in a free or half-superior 1-locular or imperfectly 2–5-locular ovary, or carpel solitary; style simple or 0, rarely divided, stigma entire or lobed; ovules 1–5, pendulous from the apex of a central placenta or from the side or top of the loculus, funicle often dilated. *Fruit* drupaceous or dry, indehiscent, 1-celled, 1-seeded, free or more or less adnate to calyx-tube and disk. *Seed* pendulous; albumen fleshy, entire or lobed, or 0; embryo straight, cotyledons leafy, rarely fleshy.

*Flowers 2-sexual; ovules 1 to each cell:—[p. 323]

Ovary somewhat 3-celled below, 1-celled above; ovules 3, pendulous;

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fertile stamens 3–5, opposite edges of petals, staminodes 5–6 opposite their centres; flowers 2-chlamydeous ....**Olax.**

Ovary 1-celled throughout; ovule solitary; fertile stamens isomerous with and opposite to petals or perianth-lobes:—

Flowers 2-chlamydeous; fertile stamens 5 opposite the petals, staminodes 5; ovule pendulous ....**Opilia.**

Flowers monochlamydeous; fertile stamens opposite perianth-lobes:—

Staminodes 0; ovule pendulous; bracts conspicuous **Lepionurus.**

Staminodes 5; ovule erect; bracts small ....**Cansjera.**

*Flowers 1-sexual; ovary 1-celled, ovules 2 pendulous:—[p. 322]

Fertile stamens opposite the petals; stigma sessile; flowers cymose **Iodes.**

Fertile stamens alternate with the petals; styles short:—

Flowers capitate; stigma dilated, cupular ....**Miquelia.**

Flowers racemose; stigma capitate ....**Natsiatum.**

169. **Olax** Linn.

Trees or shrubs, often climbing, sometimes armed; *leaves* alternate, simple, petioled; stipules 0. *Flowers* in axillary racemes or panicles, minutely bracteate. *Calyx* minute, cupular, truncate or obscurely toothed, accrescent. *Petals* hypogynous, valvate, somewhat connate, usually 6 connate in 3 pairs, or 5 with 4 connate and 1 free, rarely 5 or 3 all free. *Stamens* usually 3 fertile, opposite and attached to edges of petals, alternate with pairs of usually 6 2-fid staminodes that are opposite and attached to centre of petals, sometimes 4 or 5 fertile, and then occasionally one or two opposite centre of petals, staminodes sometimes only 5; anthers oblong 2-celled; dehiscence longitudinal. *Ovary* free, its base usually surrounded by a shallow hypogynous disk, imperfectly 3-locular (three partial dissepiments below, always 1-locular above); style simple, terminal, stigma 3-lobed; ovules 3, linear, pendulous from the tip of a central placenta. *Fruit* a small drupe, more or less covered by the accrescent fleshy calyx; stone crustaceous, 1-celled, 1-seeded. *Seed* inverted; albumen fleshy; embryo minute, apical.

†Shrubs, usually scandent, with woody twigs; flowers in racemes:—[p. 324]

‡Branches terete; racemes many-flowered:—[p. 324]

Prickly; bracts minute, shorter than peduncles ....*scandens.*

Unarmed; bracts large, imbricate, enveloping flowers.......*imbricata.*

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‡Branches angular, unarmed; racemes few-flowered [p. 323] *acuminata.*
†Undershrubs, with short erect stocks and herbaceous branches; flowers solitary [p. 323] ....*nana.*

321. Olax scandens Roxb.; F. I. i. 163; F. B. I. i. 575; E. D. O. 127.
Behar; Chota Nagpur; Chittagong.
A large climber, almost tree-like. *Hind.* Dheniani; *Beng.* Koko-aru; *Uriya* Bodo-bodoria; *Santal.* Hund; *Kol.* Rimmel.

322. Olax imbricata Roxb.; F. I. i. 164; F. B. I. i. 575.
Chittagong.
A large climber, almost tree-like.

323. Olax acuminata Wall.; F. B. I. i. 576.
E. Bengal, Dacca; Tippera, Comilla.
A climber, or shrub.

324. Olax nana Wall.; F. B. I. i. 576; E. D. O. 125.
N. Bengal; Chota Nagpur.
A small shrub with woody base and herbaceous shoots. *Santal.* Merom met.

170. **Opilia** Roxb.

Low trees or climbing shrubs; *leaves* alternate, distichous, simple, entire, 1-nerved, short-petioled; stipules 0. *Flowers* many, in axillary racemes of umbel-like cymes; bracts deciduous. *Calyx* minute annular, obscurely 5-toothed. *Petals* 5. *Stamens* 5 fertile, free, opposite the petals and alternate with 5 thick fleshy disk-glands or staminodes. *Ovary* free, sessile, 1-locular; style short, stigma minute; ovule solitary, pendulous. *Fruit* an indehiscent drupe; pericarp thin, fleshy; stone crustaceous. *Seed* inverted; albumen fleshy; embryo apical or axial.

325. Opilia amentacea Roxb.; F. I. ii. 87; F. B. I. i. 583.
Behar; W. Bengal; Orissa.
A shrub or small weak-branched tree. *Beng.* Balikoma.

171. **Lepionurus** Bl.

Small trees; *leaves* alternate, shortly petioled, simple, 1-nerved; stipules 0. *Flowers* monochlamydeous, numerous, closely set in 3-chotomous umbel-like cymes disposed in fascicled axillary racemes, each cyme subtended by an ovate bract. *Perianth* urceolate, limb 4-partite; lobes valvate. *Stamens* 4, opposite the perianth-

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lobes; disk fleshy, lining the base of perianth-tube. *Ovary* free, oblong, conical, 1-locular; stigma sessile, 4-lobed; ovule solitary. *Fruit* a glabrous drupe with crustaceous stone. *Seed* pendulous; albumen fleshy; embryo small, axial, cotyledons 3.

326. LEPIONURUS SYLVESTRIS Bl. *L. oblongifolius* F. B. I. i. 583.
Chittagong.
A small tree.

172. Cansjera A. Juss.

Shrubs, climbing, occasionally armed; *leaves* alternate, shortly petioled, 1-nerved; stipules 0. *Flowers* monochlamydeous, hermaphrodite, in dense bracted axillary spikes. *Perianth* regular, 4–5-partite, marcescent; lobes valvate. *Stamens* usually 4 fertile, occasionally 5, opposite perianth-lobes and alternate with 4–5 hypogynous staminodes or disk-glands; filaments free or adnate at the base to the thickened disk. *Ovary* superior, ovoid-conical, 1-locular; style cylindric, stigma capitate 4-lobed; ovule solitary, pendulous. *Fruit* a drupe, its base surrounded by the marcescent perianth; putamen bony. *Seed* solitary, inverted, subglobose; albumen fleshy; embryo apical, cotyledons 2–3.

327. CANSJERA RHEEDEI Gmel.; F. B. I. i. 582. *C. scandens* F. I. i. 441.
Behar, Monghyr Hills.
A climbing shrub.

173. Iodes Bl.

Shrubs, usually climbing; *leaves* opposite or subalternate, petioled, simple, 1-nerved; stipules 0. *Flowers* diœcious, dichlamydeous, in axillary or extra-axillary cymes, the lower peduncles often sterile and metamorphosed into tendrils. ♂ *Calyx* minute, cupshaped, 5-toothed. *Petals* connate, 3–5-partite; lobes valvate. *Stamens* hypogynous, 3–5, opposite the corolla-lobes; anthers 2-celled, introrse. *Ovary* rudimentary. ♀ *Calyx* minute, cup-shaped, 5-toothed. *Petals* connate in a tube often dilated below, 4–5 partite. *Stamens* or staminodes 0. *Ovary* subsessile, 1-locular; stigma sessile, discoid, 5-lobed; ovules 2, collateral, pendulous; funicle much dilated. *Fruit* a drupe, surrounded at the base by the persistent, unaltered calyx; stone crustaceous, 1-seeded. *Seed* pendulous; testa thin; albumen fleshy; embryo with leafy cotyledons.

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328. Iodes Hookeriana Baill.; F. B. I. i. 596.
Chittagong.
A climbing shrub.

174. Miquelia Meissn.

Shrubs, climbing; wood with large vessels; *leaves* alternate, petiolate, palminerved, simple, membranous; stipules 0. *Flowers* diœcious, subcapitate; peduncles extra-axillary. ♂ Peduncles racemose. *Calyx* minute, 4–5-fid. *Petals* connate below in a long pedicel-like occluded tube, limb 4–5-lobed; lobes valvate, tips inflexed. *Stamens* 4–5, alternate with corolla-lobes; filaments short; anthers introrse. *Ovary* 0. ♀ Peduncles solitary. *Calyx* minute, 4–5-fid. *Petals* 4–5, free or only faintly connate below, at length reflexed. *Staminodes* 4–5, alternate with corolla-lobes or 0. *Ovary* sessile, 1-locular; style short, stigma dilated, cupular; ovules 2, pendulous from the apex of the loculus. *Fruit* an oblong, somewhat compressed drupe, its base surrounded by the persistent unaltered calyx; stone crustaceous, rugose, 1-seeded. *Seed* pendulous; albumen fleshy; embryo with thick leafy cotyledons.

329. Miquelia gibba Baill.; F. B. I. i. 594.
W. Bengal.
A climbing shrub.

175. Natsiatum Ham.

Herbs, hardly shrubs, climbing; wood porous, medullary rays inconspicuous; *leaves* alternate, petiolate, repand, simple, palmately nerved; stipules 0. *Flowers* diœcious, dichlamydeous, in extra-axillary racemes. *Calyx* deeply 5-partite, persistent. *Petals* 5, free or connate at the base. ♂ *Stamens* 5, fertile, alternate with the petals and also with 5 antipetalous staminodes external to the antheriferous filaments; anthers erect, apiculate, 2-celled. *Ovary* rudimentary. ♀ *Staminodes* 4–6, hypogynous, alternate with as many compressed glands. *Ovary* 1-locular, sessile, villous; style short, 2–3-fid above with capitate stigmas; ovules 2, collateral, pendulous. *Fruit* an obliquely ovoid compressed drupe; stone crustaceous, 1-celled. *Seed* solitary; albumen fleshy; embryo with leafy cotyledons.

330. Natsiatum herpeticum Ham.; F. B. I. i. 595.
N. Bengal; E. Bengal; Chittagong.
A climbing shrub.

Order XXXVII. ILICINEÆ.

Shrubs or trees. *Leaves* alternate, simple, usually coriaceous and evergreen; stipules 2 minute, or 0. *Flowers* regular, small, usually 1-sexual, diœcious, ♂ with imperfect ovary, ♀ with imperfect stamens, in axillary cymes fascicles or small umbels. *Disk* 0. *Sepals* united in a 3–6-partite or -lobed calyx; segments imbricate. *Petals* 4–5, rarely 6–8, connate below in both sexes or in ♂ only, deciduous, imbricate. *Stamens* 4–5, adhering to the bases of the petals, or in ♀ the imperfect stamens sometimes free and hypogynous; filaments subulate; anthers versatile; dehiscence longitudinal, lateral. *Carpels* connate as a free 3–16-locular ovary; style 0 or very short, rarely long, stigma capitate or discoid; ovules 1 or 2 collateral in each loculus, pendulous, with raphe dorsal and funicle often cupular. *Fruit* a drupe with 2 or more free rarely connate 1-seeded stones. *Seed* with a membranous testa; albumen fleshy; embryo minute.

176. Ilex Linn.

Shrubs or trees; *leaves* alternate, usually coriaceous and evergreen, sometimes deciduous; stipules minute or 0. *Flowers* small, in axillary cymes fascicles or umbellules, diœcious or polygamo-diœcious. *Calyx* 4-lobed or -partite; lobes imbricate. *Petals* free spreading, or connate at the base in a rotate corolla. ♂ *Stamens* 4–5, adnate to base of corolla. *Ovary* rudimentary. ♀ *Stamens* 4–5, adnate to corolla or free hypogynous. *Ovary* 2–12-celled; styles 0 or very short, stigmas free or confluent on the apex of the ovary. *Fruit* a globose, rarely ovoid, drupe with 2–16 stones. *Seeds* pendulous; testa membranous; albumen fleshy; embryo minute, apical.

331. Ilex Godajam Colebr.; F. B. I. i. 604; E. D. I. 17.
Chittagong; N. Bengal, Duars.
A tree with pale ashy bark; leaves deciduous.

Order XXXVIII. CELASTRINEÆ.

Trees or erect or climbing shrubs, branches sometimes spinous. *Leaves* opposite, less often alternate, simple; stipules caducous or 0. *Flowers* regular, hermaphrodite or polygamous, small, usually cymose. *Disk* generally conspicuous, flat or tumid, lobed or entire, rarely 0. *Sepals* united in a small persistent 4–5-lobed calyx with imbricate segments. *Petals* 4–5, rarely 0, inserted below the disk or on its margin, imbricate. *Stamens* 3–5, rarely 2; filaments free, subulate or flattened, usually short; anthers 2-locular, or sometimes subconfluent at apex; dehiscence longitudinal lateral. *Carpels* united as a sessile, 3–5-locular ovary, free or confluent with disk at the base; style short or 0, stigma 3-gonous, rarely 3-partite; ovules 2 in each cell, anatropous, erect and basal, or several ascending from the inner angle with raphe ventral, rarely 1 or 2 and pendulous with raphe dorsal. *Fruit* capsular, berry-like, drupaceous or samaroid. *Seed* usually arillate, sometimes winged; albumen fleshy or 0; embryo usually large with leafy cotyledons.

Stamens 4–5, rarely more, attached to margin or below margin of disk, filaments usually incurved; seed albuminous:—
  Leaves opposite:—
    Fruit indehiscent; seeds without arillus .... **Elæodendron.**
    Fruit dehiscent; seeds arillate .... **Lophopetalum.**
  Leaves alternate; fruits dehiscent:—
    Climbers; flowers in terminal panicles; fruits subglobose; unarmed **Celastrus.**
    Erect shrubs or trees:—
      Shrubs with armed branches; flowers cymose; fruits globose **Gymnosporia.**
      Unarmed trees; flowers spicate; fruits narrowly oblong **Kurrimia.**
Stamens usually 3, attached to face of disk, always recurved; seeds without albumen; leaves opposite:—
  Fruit indehiscent, globose; seeds not winged .... **Salacia.**
  Fruit dehiscent, flattened; seeds winged .... **Hippocratea.**

177. Elæodendron Jacq.

Trees or shrubs; *leaves* opposite or subopposite, entire or crenate; stipules minute, scale-like. *Flowers* polygamous or hermaphrodite, in axillary dichotomous cymes. *Calyx* 5-cleft. *Petals* 5, spreading; disk large. *Stamens* 5; anthers subglobose. *Ovary* adnate to disk, conical, 2-, 4-, or 5-locular; style short; ovules 2 in each loculus. *Fruit* indehiscent, dry or succulent, 1–2-celled; cells 1-, rarely 2-seeded. *Seed* with membranous testa and no aril; albumen fleshy; embryo with flat cotyledons.

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332. Elæodendron glaucum Pers.; F. I. i. 638; F. B. I. i. 623; E. D. e. 73.

Chota Nagpur; W. Bengal.

A tree. *Kol.* Miri, thanki; *Santal.* Neuri.

178. Lophopetalum Wight.

Trees or shrubs; *leaves* opposite or alternate, petioled; stipules 0. *Flowers* hermaphrodite, often rather large, in axillary cymes. *Calyx* shortly 5-lobed, lobes obtuse. *Petals* 5, persistent, continuous with the large entire or lobed disk, the upper surface often crested lamellate or villous. *Stamens* 5, inserted on the disk. *Ovary* small, sunk in and adnate to the disk, trigonous or pyramidal, 3–4-locular, narrowed into a short style; stigma capitate; ovules 2-seriate, 4 or more in each loculus. *Fruit* a coriaceous 3–4-angled and 3–4-celled loculicidal capsule. *Seeds* few, occasionally winged, arillate; albumen fleshy; embryo small.

333. Lophopetalum fimbriatum Wight; F. B. I. i. 615.

Chittagong.

A tree.

179. Celastrus Linn.

Shrubs, climbing; *leaves* alternate, entire or crenulate; stipules minute deciduous, or 0. *Flowers* polygamous, in terminal or axillary racemes or panicles. *Calyx* 5-cleft. *Petals* 5, spreading; disk wide, concave. *Stamens* 5, inserted on edge of disk. *Ovary* on the disk, 2–4-locular; style short entire with stigma 3-lobed, or 3-fid with recurved segments and subcapitate stigmas; ovules 2 in each loculus, erect. *Fruit* a globose or ovoid, 1–3-celled, 1–6-seeded capsule. *Seed* with a large fleshy arillus; albumen fleshy; embryo with leafy cotyledons.

334. Celastrus paniculata Willd.; F. I. i. 621; F. B. I. i. 617; E. D. c. 854. *C. nutans* F. I. i. 623. *C. multiflora* F. I. i. 622.

Behar; Chota Nagpur; N. Bengal.

A scandent shrub. *Hind.* Mal-kungi; *Beng.* Malkangni; *Santal.* Kujari.

180. Gymnosporia W. & A.

Shrubs or small trees with often spinescent branches; *leaves* alternate; stipules 0. *Flowers* hermaphrodite, in small dichotomous cymes. *Calyx* 4–5-cleft. *Petals* 4–5, spreading; disk broad, lobed

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or sinuate. *Stamens* 4–5, attached below the disk. *Ovary* wide-based, on or partially sunk in the disk, 2-3-locular; style short, stigma 2–3-lobed; ovules 2 in each loculus. *Fruit* an obovoid or subglobose capsule, 2–3-celled; cells 1–2-seeded. *Seeds* with or without arillus; albumen fleshy; embryo with leafy cotyledons.

Branches stoutish, zigzag; leaves entire, obovate-cuneate; flowers fascicled on spines and in leaf-axils; fruit turbinate, ·25 in. long.........*emarginata*.
Branches rather slender, almost straight; leaves crenulate, suborbicular; cymes on spines or in-leaf axils, many times divided; fruit globose, ·15 in. long...*montana*.

335. Gymnosporia emarginata Roth; F. B. I. i. 621; E. D. C. 852. *Celastrus emarginata* F. I. i. 620.
Orissa, Khurda.
A shrub.

336. Gymnosporia montana Laws.; F. B. I. i. 621. *Celastrus montana* F. I. i. 620.
Chota Nagpur, Parasnath.
A shrub.

181. **Kurrimia** Wall.

Trees; *leaves* opposite, rarely alternate, clustered or subclustered towards ends of branches, coriaceous, entire, shining; stipules deciduous, at first clothing the ends of the young branches. *Flowers* in racemes or panicles. *Calyx* 5-fid; lobes recurved. *Petals* 5, inserted below margin of disk, recurved or spreading; disk 5-lobed, fleshy. *Stamens* 5, inserted below the disk. *Ovary* free, with an apical tuft of hairs, 2-locular; styles 2, filiform, twisted in bud, stigmas small capitate; ovules 2, erect in each loculus. *Fruit* an entire or 2-lobed capsule, 1–2-celled, tardily dehiscent by two valves. *Seeds* 1–2, erect, more or less covered by an arillus; albumen fleshy; embryo with linear-oblong cotyledons.

337. Kurrimia pulcherrima Wall.; F. B. I. i. 622. *Celastrus robusta* F. I. i. 626.
Chittagong.
A tree. *Vernac.* Shilkoil.

182. **Salacia** Linn.

Small trees, or climbing or sarmentose shrubs; *leaves* opposite, petiolate; stipules 0. *Calyx* 5-partite, small. *Petals* 5, imbricate; disk thick, broad or conical, lobed. *Stamens* usually 3, rarely 2 or 4, inserted on the top of the disk close to the ovary; filaments recurved. *Ovary* conical, sunk in the disk, 3-locular; style very short, stigma capitate or 3-lobed; ovules 2-seriate, 2–8 in each cell. *Fruit* indehiscent, berry-like, fleshy or firmly leathery. *Seeds* 1–4 in each cell, angular; testa firm; albumen 0; embryo with large usually corrugated cotyledons.

Flowers few, 3–6 from each tubercle, almost all axillary, pedicels under ·5 in. long:—

Leaves obtusely acuminate, distinctly serrate; branches smooth; fruit 1-celled, 1-seeded, not exceeding 1 in. across; sepals puberulous *prinoides*.

Leaves caudate-acuminate, entire; branches with wrinkled bark; fruit 2–3-celled, 2–3-seeded, 1·75–2 in. across; sepals glabrous *Roxburghii*.

Flowers many from each tubercle, tubercles almost all extra-axillary, pedicels over ·5 in. long; leaves bluntly acuminate or obtuse, hardly serrate; branches verrucose; fruit under 1 in. across……… *verrucosa*.

338. Salacia prinoides DC.; F. B. I. i. 626. *Johnia coromandeliana* F. I. i. 169.

Sundribuns, common; Behar; W. Bengal; Orissa.

A large climber with very fœtid flowers.

Beng. Modhu-phal.

339. Salacia Roxburghii Wall.; F. B. I. i. 627. *Johnia salacioides* F. I. i. 168.

Tippera; Chittagong.

A large branching shrub.

340. Salacia verrucosa Wight; F. B. I. i. 628.

Chittagong.

A shrub.

183. Hippocratea Linn.

Small trees or climbing shrubs; *leaves* opposite, petioled; stipules small, caducous. *Flowers* small, in axillary cymes or occasionally in terminal panicles. *Calyx* small, 5-partite. *Petals* 5, spreading, imbricate or valvate; disk conical or cuplike. *Stamens* 3, recurved, alternate with lobes of ovary. *Ovary* surrounded by the disk, 3-locular; style very short or 0, stigmas 1–3; ovules 2-seriate, 2–10 in each cell. *Fruit* of 3 flattened carpels connate below, usually dehiscent. *Seeds* compressed, generally winged below; albumen 0; embryo with large flat connate cotyledons.

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Flowers minute, ·05 in. across; leaves finely serrate ....*indica*.
Flowers larger, ·3 in. across; leaves shallow-crenate ....*macrantha*.

341. HIPPOCRATEA INDICA Willd.; F. I. i. 165; F. B. I. i. 624.
Behar.
A shrub with sarmentose branches. *Beng.* Kathapaharia.

342. HIPPOCRATEA MACRANTHA Korth.
Chittagong.
A shrub with sarmentose branches.

Order XXXIX. RHAMNACEÆ.

Trees, or erect or climbing, rarely cirrhose, shrubs, often spiny. *Leaves* simple, alternate or opposite, usually leathery, sometimes palminerved; stipules small deciduous, or if persistent spinescent. *Flowers* regular, hermaphrodite or polygamous, small, in lax or dense solitary or panicled cymes. *Disk* fleshy and filling the calyx-tube, or membranous and lining the calyx, entire or lobed, glabrous or tomentose. *Sepals* connate as a 4–5-fid calyx with triangular erect or recurved valvate lobes usually ridged internally. *Petals* 4–5, rarely 0, inserted on the throat of the calyx-tube, generally shorter than calyx lobes, usually clawed and hooded. *Stamens* 4–5, inserted with and opposite the petals, often hidden within them; filaments filiform, rarely dilated; anthers versatile, cells sometimes subconfluent; dehiscence longitudinal lateral or rarely extrorse. *Carpels* united as a sessile 3-, rarely 2- or 4-celled ovary, free or immersed in the disk and superior, or more or less adnate to calyx-tube; style short, simple or 2–4-cleft, stigmas terminal, capitate or 3-lobed; ovules 1 rarely 2 in each cell, erect, anatropous, the raphe dorsal rarely lateral. *Fruit* dehiscent capsular, or indehiscent dry or fleshy, free or girt at the base or to the middle by the adnate calyx-tube, or wholly inferior, 3-celled or, rarely, 1–4-celled, sometimes winged. *Seed* in each cell solitary, frequently arillate; albumen fleshy but often scanty, sometimes 0; embryo large.

*Armed shrubs or trees with strongly 3-nerved leaves; ovary sunk in disk; fruit half-superior, fleshy, with a hard 1–3-celled, 1–3-seeded core; seeds albuminous [p. 333] ....**Zizyphus.**

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*Unarmed climbers with penninerved leaves :—[p. 332]

Fruit half-superior, samaroid, 1-celled, 1-seeded below, prolonged above as a narrow coriaceous wing ; seeds without albumen ; tendrils 0 **Ventilago.**

Fruit inferior, crowned with persistent calyx, 3-celled, 3-seeded ; seeds albuminous ; tendrils usually present :—

- Fruit 3-winged ; flowers in panicled fascicles ; rachis sometimes cirrhose .... **Gouania.**
- Fruit terete ; flowers subumbellate ; branches cirrhose ...... **Helinus.**

184. Zizyphus Juss.

Trees or shrubs, often decumbent, sarmentose or climbing, armed ; *leaves* sub-2-farious, alternate, usually coriaceous, palminerved ; stipules transformed into sharp hooked or straight prickles. *Flowers* in fascicles or in sessile or peduncled cymes. *Calyx* 5-fid ; lobes spreading, keeled within. *Petals* 5, cucullate, deflexed, rarely 0 ; disk 5–10-lobed. *Stamens* 5, opposite and often nestling under the petals. *Ovary* sunk in, or adnate at base to, the disk, 2–4-locular ; styles 2–3, rarely 4, usually more or less connate, stigmas small, papillose. *Fruit* indehiscent, drupaceous, fleshy or dry, with a woody or bony 1–4-celled and 1–4-seeded putamen. *Seeds* somewhat compressed ; albumen scanty or 0 ; embryo with thick cotyledons.

Flowers in sessile axillary cymes :—
- Leaves glabrous .... *vulgaris.*
- Leaves more or less pubescent :—
  - Leaves glabrous above, woolly beneath .... *Jujuba.*
  - Leaves softly pubescent above, silky beneath .... *Œnoplia.*

Flowers in peduncled cymes :—
- Cymes axillary .... *xylopyra.*
- Cymes in terminal panicles :—
  - Leaves tomentose beneath .... *rugosa.*
  - Leaves glabrescent beneath .... *rugosa* var. *glabrescens.*

843. Zizyphus vulgaris Lamk ; F. I. i. 609 ; F. B. I. i. 633 ; E. D. z. 280.

Cultivated.

A small tree. *Hind.* Titni-ber, kandiari.

844. Zizyphus Jujuba Lamk ; F. I. i. 608 ; F. B. I. i. 632 ; E. D. z. 231.

Cultivated, general.

A small tree. *Hind.* and *Beng.* Ber; *Santal.* and *Kol.* Jom janum; *Uriya* Bar koli.

345. ZIZYPHUS ŒNOPLIA Mill.; F. I. i. 611; F. B. I. i. 634; E. D. Z. 263.

General.

A straggling shrub. *Hind.* Makai; *Beng.* Shiakol; *Uriya* Baro koli.

346. ZIZYPHUS XYLOPYRA Willd.; F. I. i. 611; F. B. I. i. 634; E. D. Z. 290.

Behar; Chota Nagpur.

A small, usually gregarious tree. *Hind.* Kat-ber; *Santal.* and *Kol.* Kar katta; *Uriya* Kanta bohul.

347. ZIZYPHUS RUGOSA Lamk; F. B. I. i. 636; E. D. Z. 273. *Z. tomentosa* F. I. i. 611.

Chittagong.

A large shrub.

347/2. Var. GLABRESCENS Prain.

Chota Nagpur; Behar; W. Bengal.

A large evergreen shrub, often climbing. *Santal.* and *Kol.* Tsekra; *Hind.* Rukh-ber.

185. **Ventilago** Gaertn.

Shrubs, climbing; *leaves* alternate, bifarious; stipules very small, caducous. *Flowers* small, in axillary and terminal panicles, with small bracteoles. *Calyx* 5-fid; lobes spreading, keeled within; tube obconic. *Petals* 5, deltoid or subcucullate; disk 5-lobed with free margin. *Stamens* 5, opposite petals and adnate to their bases; filaments longer than petals, connective produced. *Ovary* sunk in the disk, 2-locular; style very short, stigmas 2, short; ovules solitary. *Fruit* a subglobose, 1-celled, 1-seeded nut prolonged above in a linear-oblong coriaceous wing, girt below by the adnate calyx-tube. *Seed* subglobose; albumen 0; embryo with thick fleshy cotyledons.

Branches and leaves glabrous or nearly so; panicles rather lax; nut girt by the calyx at the base.................................*maderaspatana.*
Branches and leaves pubescent; panicles dense; nut girt by the calyx to the middle ....*maderaspatana* var. *calyculata.*

348. VENTILAGO MADERASPATANA Gaertn.; F. B. I. i. 631; E. D. V. 54.

Orissa; Chota Nagpur; W. Bengal.
A strong climber. *Beng.* and *Uriya* Ruktu-pita; *Hind.* Pitti.

348/2. Var. CALYCULATA King. *V. maderaspatana* F. I. i. 629. *V. calyculata* F. B. I. i. 631; E. D. V. 48.
Chota Nagpur, Singhbhum.
A strong climber. *Santal.* Bonga-sarjom.

186. **Gouania** Linn.

Shrubs, unarmed, climbing by means of tendrils; *leaves* alternate; stipules oblong, deciduous. *Flowers* polygamous, in axillary or terminal spikes, the rachis often cirrhose. *Calyx* superior, 5-fid; tube short obconic. *Petals* 5, inserted below the margin of the 5-angled or stellate disk which fills the calyx-tube. *Stamens* 5, opposite and nestling under the petals. *Ovary* sunk in the disk, 3-locular; style 3-cleft, stigmas minute; ovules solitary. *Fruit* coriaceous, inferior, tipped by the persistent calyx-teeth, 3-winged and 3-celled, the cells separating from the axis as 3 indehiscent, cocci. *Seed* obovate; testa hard, shining; albumen scanty; embryo with flattish cotyledons.

349. GOUANIA LEPTOSTACHYA DC.; F. B. I. i. 643.
Chittagong; E. and N. Bengal; Chota Nagpur.
A strong climber.

187. **Helinus** E. Mey.

Shrubs, unarmed, climbing by tendrils, branches slender angular; *leaves* alternate, entire; stipules small, deciduous. *Flowers* small, umbellate, on long slender peduncles. *Calyx* superior; tube broadly obconic. *Petals* 5, inserted in the margin of the epigynous disk which fills the calyx-tube, cucullate. *Stamens* 5, opposite to and as long as the petals. *Ovary* inferior, 3-locular; style short, 3-cleft, stigmas recurved; ovules solitary. *Fruit* inferior, obovoid-globose, 3-celled with cells 1-seeded, coriaceous, tardily dehiscent. *Seed* somewhat compressed; testa leathery, shining; albumen fleshy; embryo with rather large cotyledons and a minute radicle.

350. HELINUS LANCEOLATUS Brand.; F. B. I. i. 644.
Western Behar; Chota Nagpur.
A scandent cirrhose shrub.

Order XL. AMPELIDEÆ.

Shrubs, climbing by means of tendrils, less often erect, or small trees; rarely subherbaceous; juice copious, watery. *Leaves* alternate, usually petioled, simple or digitately or pedately, rarely pinnately or twice pinnately compound, frequently gland-dotted; petiole usually thickened at the articulate base and often expanded in a membranous stipule. *Flowers* regular, hermaphrodite or 1-sexual, in panicled umbelled or spicate cymes. *Disk* free, or united with petals stamens or ovary, annular or expanded. *Sepals* connate in a small, entire or valvately 4–5-toothed or -lobed calyx. *Petals* 4–5, free or connate, valvate, caducous. *Stamens* 4–5, opposite the petals, inserted at base of disk or between its lobes; filaments short subulate; anthers free or connate, short, 2-celled; dehiscence longitudinal introrse. *Carpels* connate as a perfectly or imperfectly 2–6-locular ovary, usually partially sunk in the disk; style short, slender or conical, or 0; stigma small or large, flat, slightly lobed; ovules 1–2 in each cell, ascending, anatropous, raphe ventral. *Fruit* indehiscent, berry-like, 1–6-celled; cells 1–2-seeded. *Seed* erect, often rugulose; albumen cartilaginous; embryo short basal.

Scandent cirrhose shrubs or herbs; stamens free; ovary 2-locular, cells 2-ovuled..**Vitis.**

Erect shrubs without tendrils; stamens connate with disk along with the petals; ovary 3–6-locular, cells 1-ovuled....................................**Leea.**

188. Vitis Linn.

Shrubs or subherbaceous plants, climbing usually by leaf-opposed tendrils rarely by adventitious roots; *leaves* simple, or 3–9-foliolate and then digitate or pedate, rarely pinnate or 2-pinnate; stipules adnate to base of petiole, membranous, or 0. *Flowers* hermaphrodite or occasionally polygamous, usually ebracteate, in small cymes disposed in racemes, spikes, panicles, or umbels. *Calyx* short, entire or 4–5-toothed or -lobed. *Petals* 4–5, cohering at the apex or free; disk conspicuous or small or 0. *Stamens* 4–5, inserted below the margin of the disk; anthers free. *Ovary* 2-, very rarely 3–4-locular; style short or 0; ovules 2 in each loculus. *Fruit* ovoid or globose, indehiscent, berry-like, 1–2-celled; cells 1–2-seeded. *Seeds* with a hard testa; albumen cartilaginous; embryo minute basal.

CSL

Leaves simple:—

Petals and stamens usually 5; inflorescence a modification of the tendrils:—

Nearly glabrous; cymose panicles ample, with or without cirrhi; leaves 3–5-lobed .... *latifolia*.

More or less woolly-tomentose; panicles usually with cirrhi:—

Branchlets, peduncles, and petioles with stiff black hairs mixed with woolly tomentum; leaves usually sinuate-dentate, at length glabrous above and woolly only on nerves beneath .... *barbata*.

Branchlets, peduncles, and petioles woolly without black hairs; leaves lobed or palmate, tomentose .... *tomentosa*.

Petals and stamens usually 4; inflorescence of true cymes:—

Stem thick, succulent, 4-winged .... *quadrangularis*.

Stem herbaceous or woody:—

Stems and leaves beneath glabrous:—

Leaves membranous, broadly ovate .... *repens*.

Leaves subcoriaceous, suborbicular .... *assamica*.

Stems and leaves beneath pubescent:—

Pubescence rufous; leaves ovate-cordate, acute or acuminate, bristly-serrate .... *adnata*.

Pubescence woolly; leaves wide-cordate, crenate, sublobate, often repand .... *repanda*.

Leaves compound; petals and stamens usually 4; inflorescence of true cymes:—

Leaflets 1–5:—

Leaves more or less pubescent:—

Pubescence present on both surfaces of leaflets:—

Leaflets 3, rarely 1; seeds compressed.......... *trifolia*.

Leaflets 5, sometimes only 3; seeds triangular .... *japonica*.

Pubescence only on lower surface of leaflets, upper side smooth; leaflets 5; seeds solitary, obliquely ovate .... *auriculata*.

Leaves glabrous:—

Style distinct; cymes very short; leaflets 3–5 .... *oxyphylla*.

Style 0:—

Leaflets 1–3:—

Cymes very short, glabrous .... *angustifolia*.

Cymes slender, large, puberulous .... *bracteolata*.

Leaflets 5, or upper only 3; cymes short, puberulous *lanceolaria*.

Leaflets 7, usually softly pubescent; cymes equalling or exceeding the petiole .... *pedata*.

351. VITIS LATIFOLIA Roxb.; F. I. i. 661; F. B. I. i. 652; E. D. v. 213.

Chota Nagpur; Behar; W. Bengal; C. Bengal.
A large herbaceous climber. *Beng.* Govila; *Santal.* Ic'er.

352. VITIS BARBATA Wall.; F. B. I. i. 651; E. D. v. 193.
E. Bengal, Dacca; Chittagong.
A large climber.

353. VITIS TOMENTOSA Heyne; F. B. I. i. 650; E. D. v. 231.
Chota Nagpur; Behar.
A woolly climber. *Santal.* Ghora lidi.

354. VITIS QUADRANGULARIS Wall.; F. B. I. i. 645. *Cissus quadrangularis* F. I. i. 407.
Sundribuns; Orissa.
A square-stemmed climber. *Beng.* and *Hind.* Harjora; *Uriya* Harbhanga.

355. VITIS REPENS W. & A.; F. B. I. i. 646. *Cissus cordata* F. I. i. 407. *C. pentagona* F. I. i. 408.
E. Bengal, W. Mymensingh; Chittagong.
A long slender climber.

356. VITIS ASSAMICA Laws.; F. B. I. i. 648.
Chittagong.
A large climber.

357. VITIS ADNATA Wall.; F. B. I. i. 647; E. D. v. 184. *Cissus adnata* F. I. i. 405.
N. Bengal; C. Bengal; E. Bengal; Chittagong.
A slender climber. *Santal.* Bod-larnari.

358. VITIS REPANDA W. & A.; F. B. I. i. 648.
Chota Nagpur; Behar; W. Bengal.
A large climber.

359. VITIS TRIFOLIA Linn. *V. carnosa* F. B. I. i. 654; E. D. v. 195. *Cissus carnosa* F. I. i. 409.
C. Bengal; E. Bengal; Sundribuns.
A considerable climber. *Beng.* Amal-lata, Sone-kesar.

360. VITIS JAPONICA Thunb. *V. mollis* F. B. I. i. 660.
Chittagong.
A considerable climber.

361. VITIS AURICULATA Roxb.; E. D. v. 191. *Cissus auriculata* F. I. i. 412.
Chota Nagpur, Singhbhum.
A large climber.

362. VITIS OXYPHYLLA Wall,

Chittagong.
An extensive climber.

363. Vitis angustifolia Wall.; F. B. I. i. 654. *Cissus angustifolia* F. I. i. 408.
N. Bengal.
A rather slender climber.

364. Vitis bracteolata Wall.; F. B. I. i. 654.
N. Bengal, Rungpur; Chittagong.
An extensive climber.

365. Vitis lanceolaria Wall.; F. B. I. i. 660. *Cissus lanceolaria* F. I. i. 412. *C. feminea* F. I. i. 410.
Chota Nagpur, Parasnath; E. Bengal, Dacca; Chittagong.
A large climber.

366. Vitis pedata Vahl; F. B. I. i. 661; E. D. V. 217. *Cissus pedata* F. I. i. 413.
Chota Nagpur; W. C. and N. Bengal.
A large weak climber. *Beng.* Goali-lata.

189. **Leea** Linn.

Small trees, erect shrubs, or herbs; branches striate or furrowed; *leaves* alternate, usually large, simple or 1–3-pinnately compound; petiole dilated at the base into sheathing stipules. *Flowers* on leaf-opposed peduncles, in corymbose cymes. *Calyx* 5-toothed. *Petals* 5, connate below and adherent to the staminal tube, revolute. *Stamens* outside the annular disk, connate below in a 5-lobed tube; filaments 5 above the tube free, inflexed, arising between the lobes; anthers free and exserted from, or connate and included in the tube. *Ovary* on the disk, 3–6-locular; style short, stigma swollen; ovules solitary in each loculus. *Fruit* 3–6-celled, 3–6-seeded, berry-like, usually succulent, subglobose, the top depressed. *Seeds* cuneate with a hard testa; albumen cartilaginous; embryo minute, basal.

Flowers red; leaves compound, primary nerves distant:—
  Leaves all 1-pinnate ....*alata.*
  Leaves all 2–3-pinnate ....*rubra.*
Flowers greenish-white:—
  *Leaves compound:—[p. 340]
    †Leaves with close, numerous primary nerves:—[p. 340]
      ‡Leaves all simply pinnate; leaflets broad, oblong, with parallel sides; petioles and rachises often winged [p. 340] ....*crispa.*

‡Leaves more or less 2-pinnate; petioles and rachises rounded :— [p. 339]

Upper leaves simply pinnate or with the lowest pair of pinnæ only 3-foliolate, lower leaves 2-pinnate; leaflets cordate at base *aspera.*

Upper leaves usually 2-pinnate like the lower; leaflets rounded or cuneate at base .... *herbacea.*

†Leaves with rather distant, fewer primary nerves, all 2–3-pinnate :— [p. 339]

Leaves glabrous beneath .... *sambucina.*

Leaves hirsute beneath :—

Leaflets with hairs and scattered flat disks beneath ......*æquata.*

Leaflets pilose on nerves but with no disks beneath ......*robusta.*

*Leaves simple, white beneath with mealy pubescence [p. 339] *macrophylla.*

367. LEEA ALATA Edgew.; F. B. I. i. 665.
W. Bengal, very rare; E. Bengal, Madhupur jungles.
A shrub, 2–5 feet high.

368. LEEA RUBRA Bl.
E. Bengal, Dacca and Mymensingh.
A dwarf shrub, 1–2 feet high.

369. LEEA CRISPA Linn.; F. I. i. 654; E. D. L. 226.
E. Bengal; Tippera; Chittagong.
A rigid shrub, 4–8 feet high. *Beng.* Ban-chálitá.

370. LEEA ASPERA Edgew.; F. B. I. i. 665; E. D. L. 224.
Chota Nagpur.
A stout spreading shrub, 6–12 feet high.

371. LEEA HERBACEA Ham. *L. crispa* F. B. I. i. 665.
W. Bengal; Chota Nagpur.
A many-stemmed shrub, 12–16 feet high.

372. LEEA SAMBUCINA Willd.; F. I. i. 657; F. B. I. i. 666; E. D. L. 241.
E. Bengal; Chittagong.
A rigid shrub, 4–10 feet high. *Beng.* Kukur-jhiwa.

373. LEEA ÆQUATA Linn. *L. hirta* F. I. i. 655; F. B. I. i. 668; E. D. L. 229.
C. and E. Bengal; Chittagong.
A shrub, 4–10 feet high. *Beng.* Kák-jhangá.

374. LEEA ROBUSTA Roxb.; F. B. I. i. 667; E. D. L. 237.
Chota Nagpur; C. Bengal; E. Bengal; Chittagong.
A shrub, 6–12 feet high. *Santal.* Haramada.

CSL

875. LEEA MACROPHYLLA Hornem.; F. I. i. 653; F. B. I. i. 664 partly; F. D. L. 232.

Chota Nagpur; Behar; Bengal generally.

A herb, 1–3 feet high; the lower leaf often 2 feet across, the upper ones ·5–1 foot. *Hind.* and *Beng.* Dhol-samudra; *Santal.* Hatkan.

Order XLI. SAPINDACEÆ.

Trees or shrubs, rarely undershrubs or herbs, sometimes climbing or twining, occasionally with tendrils. *Leaves* alternate or less often opposite, pinnate with leaflets alternate or opposite, 3-foliolate, palmate, or simple, entire or serrate, sometimes lobed; stipules very rare. *Flowers* regular or irregular, usually polygamous, always small. *Disk* annular or oblique, occasionally 0 in ♂ flowers. *Sepals* usually 4–5, free or connate, often unequal, imbricate or valvate. *Petals* usually 5, or 4 the fifth sometimes absent, occasionally 0, flat or rarely cupular, often bearded or with a basal scale. *Stamens* 5–10; filaments often pubescent, always free, inserted between ovary and disk, on the disk, or at base of disk externally, occasionally declinate; anthers 2–celled, basifixed or versatile; dehiscence longitudinal usually lateral. *Carpels* united throughout or below only, in a median or excentric, lobed or entire 1–4-locular ovary; style simple or divided, usually terminal, stigma usually simple; ovules 1–2, rarely more, in each loculus, ascending, attached to inner angle, anatropous amphitropous or campylotropous, rarely horizontal, the raphe usually ventral. *Fruit* capsular, or indehiscent and berry-like or dry, sometimes samaroid. *Seeds* globose or compressed, with or without arillus; albumen rarely present; embryo usually thick, occasionally spiral or plicate.

*Leaves alternate, stipules 0; seeds without albumen:—[p. 342]

†Ovules solitary in each cell of the ovary; stamens inserted inside the disk:—[p. 342]

Leaves 3-nate; seeds with a small arillus:—

Tendril-bearing slender climbers with 2-ternate leaves and a membranous inflated 3-celled capsule ....**Cardiospermum.**

Shrubs without tendrils; leaves digitately 3-foliolate; fruit of 1–2 globose indehiscent cocci ....**Allophylus.**

Leaves equally pinnate or (in *Aphania Danura* only) simple; fruit indehiscent, 1–3-coccate:—

‡Seeds without an ærillus:—[p. 342]

§Cocci of fruit at first united, at length spontaneously separating [p. 342] **Sapindus.**

§Cocci of fruit deeply divided to nearly their base but not spontaneously separating:—[p. 341]

Cocci oblong; testa of seed membranous; scales of the petals hooded and crested ....**Erioglossum.**

Cocci ellipsoid or sub-3-gonous; testa cartilaginous; scales of petals not crested ....**Aphania.**

‡Seeds arillate:—[p. 341]

Fruit not deeply lobed, usually more than 1 cell developed **Schleichera.**

Fruit sulcately lobed, usually only 1 coccus developed **Nephelium.**

†Ovules 2 in each cell of the ovary:—[p. 341]

Leaves pinnate; capsule coriaceous inflated, subcompressed, reniform, not winged; stamens inserted inside the disk; seeds arillate **Harpullia.**

Leaves simple; capsule membranous not inflated, much compressed, oblong, winged; stamens inserted outside the disk; seeds without arillus ....**Dodonæa.**

*Leaves opposite, stipulate; seeds albuminous, without arillus; stamens inserted outside the disk; ovules 2 in each cell of ovary [p. 341] **Turpinia.**

190. Cardiospermum Linn.

Herbs with wiry stems and branches, climbing by tendrils; *leaves* alternate, 2-ternate; leaflets dentate; stipules 0. *Flowers* irregular, polygamo-diœcious, in axillary racemes, the lowest pair of pedicels transformed into spiral tendrils. *Sepals* 4, concave, the outer pair smaller. *Petals* 4, in 2 pairs, the lateral larger pair usually adnate to sepals and each with an emarginate supra-basal scale, the smaller pair inferior remote from stamens and each with a small crested scale; disk one-sided, almost reduced to two glands opposite the lower petals. *Stamens* 8, excentric; filaments free or connate below, the 4 nearer the glands shorter than the others. *Ovary* 3-locular; style very short, 3-fid, or styles 3; ovules solitary, ascending. *Fruit* an inflated 3-celled, loculicidally 3-valved capsule with membranous reticulate valves. *Seeds* globose with a basal arillus and crustaceous testa; albumen 0; embryo with large conduplicate cotyledons.

376. Cardiospermum Halicacabum Linn.; F. I. ii. 292; F. B. I. i. 670; E. D. C. 551.

Everywhere, common.

A climbing herb with wiry stems. *Beng.* Sibjhul, nayaphutki.

GSL

191. **Allophylus** Linn.

Small trees or shrubs; *leaves* 1- or 3-foliolate; leaflets entire or serrate; stipules 0. *Flowers* small, polygamō-diœcious, pedicelled, in simple or branched axillary racemes. *Sepals* 4 in opposite pairs, hooded, membranous, much imbricate; the outer pair the smaller. *Petals* 4, small or almost obsolete, generally declinate, with or without a shaggy scale inside; disk unilateral with usually 4 glands opposite the petals. *Stamens* 8, inserted inside the disk. *Ovary* usually 2-lobed and 2-locular; styles usually 2, free or more often connate below, stigmas small; ovules ascending, solitary in each cell. *Fruit* indehiscent, 1–2-lobed; lobes dry or fleshy. *Seeds* usually with a short arillus; albumen 0; embryo curved.

Leaflets ovate :—
  Shoots and leaves glabrescent; leaflets serrate ......*Cobbe* var. *serrata*.
  Shoots and leaves very hairy; leaflets subentire......*Cobbe* var. *villosa*.
Leaflets lanceolate, glabrous ....*Cobbe* var. *glabra*.

377. ALLOPHYLUS COBBE Linn.; F. B. I. i. 673; E. D. A. 787. *Ornithotrope Cobbe* F. I. ii. 268. Var. SERRATA. *Ornithotrope serrata* F. I. ii. 266; *O. aporetica* F. I. ii. 264.
Orissa; C. Bengal; E. Bengal.

377/2. Var. VILLOSA. *Ornithotrope villosa* F. I. ii. 265.
Chittagong.

377/3. Var. GLABRA. *Ornithotrope glabra* F. I. ii. 267.
Sundribuns; E. Bengal; Chittagong.

192. **Sapindus** Linn.

Trees or shrubs; *leaves* alternate, even-pinnate; leaflets coriaceous, entire; stipules 0. *Flowers* regular, polygamous, in terminal and axillary panicles. *Sepals* 4–5, 2-seriate, widely imbricate. *Petals* 4–5, with or without scales on their inner face, sometimes disposed semilaterally; disk annular, complete. *Stamens* 8, or sometimes 6 or 10, inserted within the disk, more or less unilateral. *Ovary* lobed, 3–4-locular; style terminal, stigma 3–4-lobed; ovules solitary in each loculus. *Fruit* fleshy, 2–3-lobed, the lobes at first united but ultimately separating as distinct indehiscent subglobose cocci. *Seeds* with a crustaceous or membranous testa; albumen 0; embryo with thick cotyledons.

GSL

Ovary hairy; leaflets 6–4, usually pubescent beneath; anthers apiculate *trifoliatus.*

Ovary glabrous; leaflets 16–10, glabrous; anthers obtuse ......*Mukorossi.*

378. SAPINDUS TRIFOLIATUS Linn.; F. B. I. i. 682; E. D. S. 818. *S. laurifolia* F. I. ii. 278. *S. emarginata* F. I. ii. 279.
Cultivated, fairly generally; appears to be wild, but very rare, in Chota Nagpur.
A tree. *Beng.* Bor ritha; *Uriya* Makta maya.

379. SAPINDUS MUKOROSSI Gaertn.; F. B. I. i. 683; E. D. S. 808. *S. detergens* F. I. ii. 280.
Cultivated.
A tree. *Beng.* Ritha; *Uriya* Itá; *Hind.* Ritha, dodan.

193. Erioglossum Bl.

Trees or shrubs; *leaves* imparipinnate, alternate; leaflets opposite or nearly so, entire; stipules 0. *Flowers* irregular, polygamo-diœcious, in elongated erect terminal panicles. *Sepals* 5, unequal, orbicular, concave, widely imbricate. *Petals* 4, unequal, obovate, clawed, with a hooded, apically lobed scale on the inner face; disk unilateral, lobed. *Stamens* 8, more or less unilateral. *Ovary* stipitate, obcordate, 3-lobed and 3-locular; style slender, stigma obscurely 3-lobed; ovules solitary in each loculus. *Fruit* indehiscent, deeply 1–3-lobed; segments oblong not separating as distinct cocci. *Seeds* oblong with membranous testa; arillus 0; albumen 0; embryo straight with thick cotyledons.

380. ERIOGLOSSUM EDULE Bl.; F. B. I. i. 672; E. D. E. 310. *Sapindus rubiginosa* F. I. ii. 282.
C. Bengal, rare; E. Bengal; Chittagong.
A small tree.

194. Aphania Bl.

Trees or shrubs; *leaves* alternate, even-pinnate, or 1-foliolate or simple and then sub-verticillately clustered; stipules 0. *Flowers* regular, polygamous, in terminal and axillary panicles. *Sepals* 4–5, 2-seriate, widely imbricate. *Petals* 4–5, with or without scales on their inner face, always disposed regularly; disk annular, complete. *Stamens* 6, 7, or 8, inserted within the disk, regularly disposed on all sides. *Ovary* entire or lobed, 2–3-locular; style terminal, stigma 2–3-lobed; ovules solitary in each loculus. *Fruit* fleshy, 1–2-lobed, indehiscent, the lobes ellipsoid not separating as distinct cocci. *Seeds* with crustaceous or membranous testa, sometimes with fleshy edible arillus; albumen 0; embryo with thick cotyledons.

Leaves pinnate, scattered ....*rubra.*
Leaves simple, crowded at bases and ends of shoots ....*Danura.*

381. APHANIA RUBRA Radlk. *Scytalia rubra* F. I. ii. 272. *Sapindus attenuata* F. B. I. i. 684; E. D. S. 806.

Chittagong.

A small tree. *Vernac.* Lal koi-pura.

382. APHANIA DANURA Radlk. *Scytalia Danura* F. I. ii. 274. *S. verticillata* F. I. ii. 273. *Sapindus Danura* F. B. I. i. 684.

Sundribuns; Chittagong.

A small tree. *Beng.* Danura.

195. Schleichera Willd.

Trees; *leaves* alternate, even-pinnate; leaflets subopposite, quite entire, or slightly serrate; stipules 0. *Flowers* regular, polygamo-diœcious, fascicled in simple racemes or panicles. *Calyx* 4–5-fid, small, cupular; lobes valvate or subvalvate. *Petals* 0; disk complete, annular. *Stamens* 6–8, inserted within the disk. *Ovary* ovoid, 3–4-locular, narrowed to the rigid style; stigma 3–4-cleft; ovules erect, solitary in each cell. *Fruit* dry, indehiscent, 1–3-celled, firmly but thinly coriaceous. *Seeds* erect, arillate; albumen 0; embryo with conduplicate, unequal, connate cotyledons.

383. SCHLEICHERA TRIJUGA Willd.; F. I. ii. 277; F. B. I. i. 681; E. D. S. 950.

Behar; Chota Nagpur.

A large tree. *Hind.* Kusum; *Santal.* Baru.

196. Nephelium Linn.

Trees or shrubs; *leaves* alternate, usually even-pinnate; leaflets entire or rarely dentate, subalternate; stipules 0, or very rarely with lowest pairs of leaflets stipuliform. *Flowers* regular, polygamous, in terminal and axillary panicles. *Calyx* 4–8-lobed, usually cupular, lobes subvalvate. *Petals* small without scales, or 0; disk fleshy, glabrous or pubescent. *Stamens* 6, 8, or 10, inserted within the disk. *Ovary* pubescent, subverrucose, lobed, 2–3-locular; style erect, stigma 2–3-lobed; ovules solitary in each loculus. *Fruit* indehiscent, 1–3-, but usually 1-coccous, oblong or globose, echinate or tubercled, rarely smooth. *Seeds* globose, erect, with coriaceous testa, enveloped in a pulpy arillus; albumen 0; embryo with very thick firmly fleshy cotyledons.

Petals 0; calyx dentate; disk glabrous..................................*Litchi.*
Petals present; calyx deeply lobed; disk tomentose ....*Longana.*

384. NEPHELIUM LITCHI Camb.; F. B. I. i. 687; E. D. N. 68.
Scytalia Litchi F. I. ii. 269.
Planted generally.
A tree. *Hind.* Lichi: The Lit-chi.

385. NEPHELIUM LONGANA Camb.; F. B. I. i. 688; E. D. N. 72.
Scytalia Longan F. I. ii. 270.
Planted occasionally.
A tree. *Beng.* Ashphal. The Longan.

197. Harpullia Roxb.

Trees; *leaves* alternate, even-pinnate; leaflets alternate; stipules 0. *Flowers* regular, polygamous or polygamo-diœcious, in axillary or subterminal racemes or panicles. *Sepals* 4–5, erect, equal, imbricate. *Petals* 4–5, narrowly obovate, without glands or scales; disk obscure. *Stamens* 5–8, elongated, inserted inside the disk. *Ovary* tomentose, ellipsoid or oblong, 2-locular; style elongated, stigma linear, twisted; ovules usually 2 superposed in each loculus. *Fruit* a coriaceous, inflated, 2-lobed, 2-celled, loculicidally 2-valved capsule. *Seeds* 1–2 in each cell, subglobose, usually arillate; albumen 0; embryo with thick hemispheric cotyledons.

386. HARPULLIA CUPANIOIDES Roxb.; F. I. i. 645; F. B. I. i. 692.
Chittagong.
A straight-stemmed tree. *Vernac.* Harpulli.

198. Dodonæa Linn.

Shrubs; *leaves* simple, alternate; stipules 0. *Flowers* minute, polygamous or polygamo-diœcious, in lateral and terminal cymes. *Sepals* 2–5, imbricate or valvate. *Petals* 0; disk obsolete in ♂, small in ♀ flowers. *Stamens* 5–10, but usually 8, inserted on the outer side of the disk. *Ovary* 3–6-angled and 3–6-locular; style

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3–6-sided, apex 3–6-cleft; ovules 2 collateral or superposed, or occasionally 1, in each loculus. *Capsule* 2–6-sided, membranous or coriaceous, septicidally 2–6-valved, valves dorsally winged. *Seeds* 1–2 in each cell, subglobose or compressed lenticular, without arillus; albumen 0; embryo spiral.

387. DODONÆA VISCOSA Linn.; F. B. I. i. 697; E. D. D. 725.
D. angustifolia F. I. ii. 256. *D. dioica* F. I. ii. 256.
Tirhut; Chota Nagpur; N. Bengal; Chittagong.
A shrub. *Hind.* Aliár. A good hedge-plant.

199. Turpinia Vent.

Trees or shrubs, with smooth branches; *leaves* opposite, odd-pinnate; leaflets opposite, stipellate, serrulate; stipules interpetiolar, deciduous. *Flowers* small, hermaphrodite, regular, in terminal and axillary panicles. *Calyx* 5-partite, lobes imbricate. *Petals* 5, imbricate; disk raised, lobed or crenulate. *Stamens* 5, inserted outside the disk. *Ovary* sessile, 3-lobed and 3-locular; style long, stigmas 3, subcapitate; ovules in each loculus 2 collateral, or several 2-seriately superposed. *Fruit* indehiscent, subglobose, berry-like, 3-celled. *Seeds* angular; testa hard shining, arillus 0; albumen fleshy; embryo straight.

388. TURPINIA POMIFERA DC.; F. B. I. i. 698; E. D. T. 847.
Dalrympelia pomifera F. I. i. 633.
Chittagong.
A tree. *Vernac.* Janoki jam.

Order XLII. SABIACEÆ.

Shrubs, usually climbing, or erect trees. *Leaves* alternate, simple or compound pinnate; stipules 0. *Flowers* regular or irregular, hermaphrodite or polygamous, usually panicled, small. *Disk* usually small, annular. *Sepals* imbricate, connate in a 4–5-partite calyx. *Petals* 4–5, equal or unequal, opposite or alternate with sepals, imbricate. *Stamens* 4–5, opposite the petals, inserted at the base of or on the small disk, all perfect or 3 without anthers; antheriferous filaments clavate or obcuneate, the sterile subulate; anthers didymous, cells 2, discrete; dehiscence transverse, or valvular by a deciduous cap. *Carpels* more or less connate below in a compressed or 3-lobed 2–3-locular ovary; styles 2–3 free or connate, or 0, stigmas minute; ovules in each loculus 1–2, superposed or collateral, horizontal or pendulous, raphe ventral. *Fruit* of 1–2 dry or fleshy, globose or compressed, indehiscent ripe carpels, with a hard 1-seeded endocarp. *Seeds* compressed or globose, basal, with a broad hilum; albumen 0 or thin and adherent to testa; embryo large, with thick often contorted cotyledons.

Stamens 4–5, all perfect and equal; drupes compressed; climbing shrubs ....**Sabia.**
Stamens 5, very unequal, 2 only fertile; drupes subglobose; trees **Meliosma.**

200. **Sabia** Colebr.

Shrubs, sarmentose or climbing; branches with bud-scales persisting at their bases; *leaves* simple, entire, alternate; stipules 0. *Flowers* usually hermaphrodite, 2-bracteolate, axillary and solitary or in axillary simple or panicled cymes; the members of all the whorls opposite. *Calyx* 4–5-partite. *Petals* 4–5; disk annular, 4–5-lobed. *Stamens* 4–5, inserted at base of disk. *Carpels* 2, rarely 3, very slightly connate; styles 2, erect, terminal, slightly connate; ovules 2 in each carpel, collateral or superposed, horizontal. *Fruit* of 1–2 dry or drupaceous ripe carpels, usually somewhat compressed and gibbous with a subbasal style. *Seeds* 1–2 in each carpel, reniform, with coriaceous testa; albumen 0; embryo curved.

389. SABIA LIMONIACEA Wall.; F. B. I. ii. 3.
Chittagong.
A large climber with slender branches.

201. **Meliosma** Bl.

Trees or shrubs, usually more or less pubescent; *leaves* simple or imparipinnate, with subopposite leaflets, rarely paripinnate; stipules 0. *Flowers* small, irregular, hermaphrodite, in branched terminal or axillary panicles; bracts caducous. *Sepals* and bracteoles persistent, 5–9, in an indistinguishable uninterrupted spiral round the petals. *Petals* 5, outer 3 larger suborbicular, inner 2 smaller; the outer valvate or imbricate, the inner often scale-like; disk annular or cupshaped, with 2–5 simple or divided teeth. *Stamens* altogether 5; 2 opposite the inner petals fertile, filaments short, flattened, incurved, adnate below to the petals, expanded upwards as a cup, bearing 2 globose transversely dehiscing anther-cells springing back elastically; 3 opposite the outer petals deformed, 2-fid, with empty cells, together forming a hood over the pistil. *Ovary* sessile, 2-, rarely 3-locular, contracted into a simple or partible style; stigma simple; ovules 2 in each loculus. *Fruit* a small, obliquely subglobose drupe; stone crustaceous, 1-celled, with usually a basilar projection over which the seed is curved. *Seed* globose; testa membranous; albumen 0; embryo curved.

Leaves simple ....*simplicifolia.*
Leaves pinnately compound ....*pinnata.*

390. Meliosma simplicifolia Bl.; F. B. I. ii. 5. *Millingtonia simplicifolia* F. I. i. 103.
Chittagong; N. Bengal.
A tall tree. *Vernac.* Dant-rangi.

391. Meliosma pinnata Planch.; F. B. I. ii. 6. *Millingtonia pinnata* F. I. i. 104.
Chittagong.
A tree. *Vernac.* Bativa.

Order XLIII. ANACARDIACEÆ.

Trees or shrubs, often with acrid or balsaminous or resinous juice. *Leaves* alternate or very rarely opposite, simple or compound and 1–3-foliolate or unequally pinnate; stipules 0, or the lowest leaflets sometimes stipule-like. *Flowers* usually regular, hermaphrodite polygamous or 1-sexual, always small. *Disk* cupular or annular or flat, entire or lobed, rarely 0. *Sepals* connate in a 3–5-partite calyx with imbricate segments, sometimes accrescent, rarely spathaceous. *Petals* usually 3–5, rarely 0, alternate with sepals, free, imbricate or valvate, sometimes accrescent. *Stamens* as many as petals, rarely more; filaments usually subulate, inserted below base of, rarely on, the disk; anthers 2-celled, basifixed or versatile; dehiscence longitudinal, introrse. *Carpels* solitary or 2, connate but one early suppressed, less often connate as a 2–5-locular ovary, rarely 5–6 free, superior or rarely half-inferior; generally rudimentary, solitary or connate as a 2–3-fid sterile ovary in ♂ flowers; styles 1–4 or stigma subsessile; ovules solitary in each loculus or carpel, pendulous from top or wall of carpel or from an ascending basal funicle. *Fruit* usually a 1-celled, 1-seeded, or a 2–5-celled and 2–5-seeded drupe, with the stone sometimes dehiscent. *Seed* erect, horizontal or pendu-

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lous; albumen 0 or very scanty; embryo large, with fleshy cotyledons.

- Leaves simple :—
  - Parts of the flower not altered in fruit :—
    - Carpels 5, rarely 4 or 6, but only 1 fertile ; stamens 8–10 **Buchanania.**
    - Carpels solitary ; stamens (in all our species) 1 only ...**Mangifera.**
  - Parts of the flower altered in fruit :—
    - Petals accrescent ; calyx and peduncle unaltered ; carpel solitary **Swintonia.**
    - Petals not accrescent :—
      - Ovary inferior, composed of 3 united carpels but 1-celled 1-ovuled ; drupe more or less sunk in the fleshy calyx ; stamens 5 :—
        - Petals imbricate ; calyx 5-lobed ; style 1............**Drimycarpus.**
        - Petals valvate ; calyx shortly 5-toothed ; styles 3 ...**Holigarna.**
      - Ovary superior, drupe set on a much enlarged apex of peduncle ; petals imbricate :—
        - Stamens 5 ; styles 3 ; ovule pendulous from a nearly apical funicle ; ovary 1-celled, but composed of 3 united carpels **Semecarpus.**
        - Stamens 8–10 ; style 1 ; ovule with a basilar funicle ; carpel solitary ....**Anacardium.**
- Leaves pinnately compound :—
  - Drupe 1-celled, 1-seeded :—
    - Trees ; styles 3 :—
      - Ovule pendulous from near apex of ovary ; drupe crowned by the distant styles ; leafless at time of flowering ....**Odina.**
      - Ovule with a basilar funicle ....**Rhus.**
    - Climber ; style 1...**Tapiria.**
  - Drupe 2–5-celled, 2–5-seeded ; ovules pendulous ; leaflets (in our species) with a distinct marginal nerve ....**Spondias.**

202. Buchanania Roxb.

Trees ; *leaves* alternate, petioled, simple, entire ; stipules 0. *Flowers* small, hermaphrodite, in crowded terminal and axillary panicles. *Calyx* short, 3–5-toothed or -lobed, persistent, lobes imbricate. *Petals* 4–5, oblong, recurved, imbricate ; disk orbicular, 5-lobed. *Stamens* 8 or 10, free, inserted at the base of the disk. *Carpels* 5–6, free, situated in the cavity of the disk, one fertile, the others imperfect ; style stout, stigma truncate ; ovule solitary, pendulous from a basal funicle. *Fruit* a small, slightly fleshy

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drupe; stone crustaceous or bony, 2–valved. *Seed* gibbous, acute at one end; albumen 0; embryo with thick cotyledons.

Panicles pubescent, stout, stiff; flowers sessile; leaves broad, tomentose on both surfaces .... *latifolia.*
Panicles quite glabrous; flowers with slender pedicels; leaves narrow, quite glabrous .... *lancifolia.*

392. Buchanania latifolia Roxb.; F. I. ii. 385; F. B. I. ii. 23; E. D. B. 913.
Orissa; Chota Nagpur.
A tree. *Hind.* and *Beng.* Piyár, piyál; *Kol.* Tarum.

393. Buchanania lancifolia Roxb.; F. I. ii. 386; F. B. I. ii. 24.
Chittagong.
A tree.

203. **Mangifera** Linn.

Trees; *leaves* alternate, petioled, coriaceous, quite entire; stipules 0. *Flowers* small, polygamous, in terminal panicles, pedicels jointed; bracts deciduous. *Calyx* 4–5-partite; segments imbricate, deciduous. *Petals* 4–5, free or adnate to the disk, imbricate; disk swollen or narrow. *Stamens* 1, or 2–5, rarely 8, inserted just inside the disk or upon the disk; when more than 1 usually the others with smaller anthers, or imperfect anthers, or without anthers. *Ovary* sessile, oblique, 1-locular with a lateral style; stigma simple; ovule pendulous from a basal or lateral funicle, rarely horizontal, solitary. *Fruit* a large fleshy drupe with a compressed fibrous stone. *Seed* large, compressed; testa thin; albumen 0; embryo with flattened, often oblique and unequal, sometimes lobed, cotyledons.

Calyx and panicles quite glabrous:—
  Panicles and long pedicels very slender; petals obtuse ....*longipes.*
  Panicles and short pedicels very stout; petals acute, (white; disk cupular; drupes acute) ....*sylvatica.*
Calyx and panicles minutely tomentose or pubescent; panicles and short pedicels very stout; petals acute, yellow with reddish streaks; disk 5-lobed; drupes obtuse..*indica.*

394. Mangifera longipes Griff.; F. B. I. ii. 15.
Chittagong.
A tree, usually near the coast. *Beng.* Jangli am, uriam (*Chittagong*); *Magh.* To-sára.

395. MANGIFERA SYLVATICA Roxb.; F. I. i. 644; F. B. I. ii. 15; E. D. M. 209.

Chittagong.

A tree, usually inland. *Beng.* Kosham.

396. MANGIFERA INDICA Linn.; F. I. i. 641; F. B. I. ii. 13; E. D. M. 147.

Everywhere planted.

A tree. *Uriya, Beng.* and *Hind.* Am, amb; *Santal.* and *Kol.* Ul, uli; *Mágh.* Ing-sára.

204. **Swintonia** Griff.

Tall glabrous trees; *leaves* alternate, long-petioled, simple, entire; stipules 0. *Flowers* in terminal and axillary large panicles, hermaphrodite or polygamous. *Calyx* small, 5-lobed; lobes obtuse, imbricate. *Petals* 5, adnate to the short or long cylindric disk, linear-oblong, imbricate, accrescent and persistent reflexed in fruit. *Stamens* 5, inserted on the disk, free. *Ovary* sessile, ovoid, 1-locular, narrowed into the slender style; stigma small capitate; ovule solitary, pendulous from a basal funicle. *Fruit* an ovoid, smooth, sessile, leathery drupe, subtended by the 5 enlarged reflexed petals. *Seed* erect; testa thin; albumen 0; cotyledons amygdaloid.

397. SWINTONIA FLORIBUNDA Griff. *S. Griffithii* F. B. I. ii. 26. *S. Schwenkii* E. D. S. 3040.

Chittagong.

A lofty tree. *Beng.* Boilsur, boilam.

205. **Drimycarpus** Hook. f.

Tall trees; *leaves* alternate, petioled, simple, quite entire; stipules 0. *Flowers* small, polygamo-diœcious, in axillary fascicled racemes. *Calyx* superior, 5-lobed; lobes obtuse, imbricate. *Petals* 5, erect, orbicular, imbricate; disk broad annular. *Stamens* 5, inserted at the base of the disk. *Ovary* inferior, 1-locular; style short, stigma capitate; ovule solitary, lateral. *Fruit* a fibrous drupe with resinous flesh, transversely obliquely ovoid; stone thickly leathery. *Seed* attached to wall of cell; testa membranous; albumen 0; embryo thick, with large cotyledons.

398. DRIMYCARPUS RACEMOSUS Hook. f.; F. B. I. ii. 36; E. D. D. 834. *Holigarna racemosa* F. I. ii. 82.

Chittagong.

A tall tree. *Beng.* Telsur; *Magh.* Sangrin.

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206. **Holigarna** Ham.

Tall trees; *leaves* alternate, simple, entire, coriaceous; petiole with one or two pairs of deciduous appendages; stipules 0. *Flowers* small, polygamo-diœcious, crowded in axillary and terminal racemes or panicles. *Calyx* superior, tube cupular, teeth 5, imbricate. *Petals* 5, connate below and adnate to edge of disk; disk lining calyx-tube in ♂, obscure in ⚥ flowers. *Stamens* 5, inserted on edge of disk, adnate to the petals below. *Ovary* inferior, 1-locular; styles usually 3, sometimes 4–5, terminal, stigmas capitate or clavate; ovules solitary pendulous, lateral but from near apex of loculus. *Fruit* a resinous, acrid, subcompressed, ovoid or oblong drupe; stone coriaceous. *Seed* parietal, testa membranous; albumen 0; embryo thick with large cotyledons.

399. HOLIGARNA LONGIFOLIA Roxb.; F. I. ii. 80; F. B. I. ii. 37; E. D. H. 317.

Chittagong.

A tall tree. *Beng.* Barola.

207. **Semecarpus** Linn. f.

Trees; *leaves* alternate, simple, entire, coriaceous; stipules 0. *Flowers* small, polygamous or diœcious, in usually terminal panicles. *Calyx* 5–6-fid; segments deciduous. *Petals* 5–6, imbricate; disk broad annular. ♂ ⚥ *Stamens* 5–6, inserted at the base of the disk. ⚥ ♀ *Ovary* 1-locular, stamens imperfect or 0; styles 3, stigmas subclavate; ovule solitary, pendulous from a basal funiculus. *Fruit* a firm drupe, oblong or subglobose, oblique, seated on a fleshy receptacle formed of the accrescent disk and calyx-base; pericarp resinous acrid. *Seed* pendulous; testa coriaceous, tegmen somewhat fleshy; albumen 0; embryo thick with convex cotyledons.

Leaves leathery, blunt, densely pubescent and strongly net-veined beneath; ovary pubescent ....*Anacardium.*

Leaves papery, acuminate, glabrous, and not very strongly veined beneath; ovary glabrous ....*subpanduriformis.*

400. SEMECARPUS ANACARDIUM Linn. f.; F. I. ii. 83; F. B. I. ii. 35; E. D. S. 1041.

Behar; Chota Nagpur.

A tree. *Hind.* and *Beng.* Bhela; *Uriya* Bhallia; *Santal.* Soso; *Kol.* Loso.

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401. SEMECARPUS SUBPANDURIFORMIS Wall.; F. B. I. ii. 35.
Chittagong.
A tree.

208. **Anacardium** Rottb.

Shrubs or trees; *leaves* alternate, petioled, simple, entire; stipules 0. *Flowers* small, polygamous, in terminal bracteate panicles. *Calyx* 5-partite; segments erect, imbricate, deciduous. *Petals* 5, linear-lanceolate, recurved, imbricate; disk erect, filling the calyx-tube. *Stamens* 8–10, usually 9, all fertile or some sterile, one usually larger than the others; filaments connate at the base and adnate to the disk. *Ovary* 1-locular, ovoid or obcordate; style excentric filiform, stigma minute; ovule solitary, ascending from a lateral funiculus. *Fruit* a kidney-shaped nut, seated on a large pyriform fleshy mass derived from the accrescent disk and top of peduncle; pericarp cellular and filled with oil. *Seed* kidney-shaped, ascending; testa membranous, adherent; albumen 0; embryo curved, cotyledons semilunar.

402. ANACARDIUM OCCIDENTALE Linn; F. I. ii. 312; F. B. I. ii. 20; E. D. A. 1014.
Cultivated and sometimes appearing as wild, especially in Orissa and Chittagong.
A small tree, native of America. *Hind.* Kaju; *Beng.* Kaju, hidgli-badam.

209. **Odina** Roxb.

Trees; *leaves* alternate, clustered at the ends of the stout, soft branches, odd-pinnate, deciduous; leaflets opposite; stipules 0. *Flowers* small, monœcious or polygamo-diœcious, short-pedicelled, fascicled in tufted terminal racemes or panicles. *Calyx* 4–5-lobed, persistent; lobes rounded, imbricate. *Petals* 4–5, imbricate; disk annular, 4–5-lobed. ♂ *Stamens* 8–10, inserted within the disk. *Ovary* rudimentary, 4-partite. ⚥ ♀ *Stamens* 8–10 or 0. *Ovary* sessile, oblong, 1-locular; styles 4, stout, stigmas simple or capitellate; ovule solitary, pendulous. *Fruit* a small compressed reniform drupe, tipped by the distant styles; stone hard. *Seed* compressed; albumen 0; embryo curved.

403. ODINA WODIER Roxb.; F. I. ii. 293; F. B. I. ii. 29; E. D. O. 38.
In every province, including the Sundribuns.

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A deciduous tree. *Beng.* Jiyal; *Hind.* Jhingan; *Uriya* Indramai; *Kol.* and *Santal.* Dhoka.

210. **Rhus** Linn.

Trees or shrubs, with often an acrid juice; *leaves* alternate, simple or 1–3-foliolate or pinnate; leaflets entire or serrate; stipules 0. *Flowers* small, polygamous. *Calyx* small, 4–6-partite, persistent; segments subequal, imbricate. *Petals* 4–6, equal, spreading, imbricate; disk cupular, lobed. *Stamens* 4–6, or 10, inserted at base of disk, free; filaments subulate; anthers in functional female flowers often imperfect. *Ovary* sessile, ovoid or globose, 1-locular; styles 3, free or slightly connate below, stigmas simple or capitate; ovule solitary, pendulous from a basal funiculus. *Fruit* small, compressed, dry, drupe-like; stone coriaceous, crustaceous, or bony. *Seed* pendulous from the funiculus; testa membranous; albumen 0; embryo curved, with flattish cotyledons.

404. RHUS KHASIANA Hook. f.; F. B. I. ii. 10.

Chittagong.

A large tree, with odd-pinnate leaves. *Vernac.* Kakrasingha.

211. **Tapiria** Juss.

Scandent shrubs, or trees; *leaves* alternate, odd-pinnate; leaflets numerous, subopposite, serrate; stipules 0. *Flowers* small, polygamous, in axillary and terminal panicles. *Calyx* 5-partite; lobes imbricate, persistent. *Petals* 5, small, oblong, imbricate; disk broad, 5-lobed. *Stamens* 10, inserted at the base of the disk. *Ovary* sunk in the disk, 4–5-lobed, with 4–5 styles in ♂ flowers; in functional ♀ flowers ovoid, more free, 1-locular, with 1 short conic style and simple stigma; ovule pendulous from apex of cell. *Fruit* an obliquely oblong, fleshy, balsamiferous drupe; stone crustaceous, rugose. *Seed* oblong; testa membranous; albumen 0; embryo straight, cotyledons large.

405. TAPIRIA HIRSUTA Kurz; F. B. I. ii. 28. *Robergia hirsuta* F. I. ii. 455.

Chittagong; Tippera.

A scandent, usually softly villous shrub.

212. **Spondias** Linn.

Trees; *leaves* alternate, odd-pinnate, usually crowded at the ends of the branches; leaflets opposite; stipules 0. *Flowers* small,

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polygamous, in terminal spreading panicles. *Calyx* small, 4–5-fid, deciduous; lobes slightly imbricate. *Petals* 4–5, spreading, subvalvate; disk broad, cupular, crenate. *Stamens* 8–10, inserted beneath the disk. *Ovary* sessile, free, 4–5-locular; styles 4–5, connivent; ovules solitary, pendulous in each loculus. *Fruit* a fleshy drupe, with a hard 1–5-celled stone, the cells erect or diverging and opening by canals in the top of the stone. *Seeds* pendulous; testa membranous; albumen 0; embryo straight, cotyledons elongate.

Leaflets 4–6-jugate, quite entire ....*mangifera.*
Leaflets 6–8-jugate, crenate-serrate..*dulcis.*

406. Spondias mangifera Willd.; F. I. ii. 451; F. B. I. ii. 42; E. D. s. 2649.

In all the provinces; often planted.

A tree. *Vernac.* Amra. The Indian Hog-Plum.

407. Spondias dulcis Willd.; F. I. ii. 452; F. B. I. ii. 42; E. D. s. 2644.

Occasionally planted.

A tree. *Vernac.* Amra. The Hog-Plum, or Otaheite Apple. Native of Polynesia.

Order XLIV. MORINGEÆ.

Trees, with soft white wood and with gummy juice. *Leaves* alternate, compound, simply or 2–3-pinnately divided; leaflets opposite, entire; stipules and stipels 0 or reduced to glands at bases of leaves and pinnules. *Flowers* irregular, hermaphrodite, in axillary panicles. *Disk* lining calyx-tube. *Sepals* connate in a cupular 5-cleft calyx; segments unequal, imbricate, the odd one posterior, subpetaloid, deciduous. *Petals* 5, unequal, the upper pair small, the lowest largest. *Stamens* declinate, 5 perfect opposite petals with 5–7 alternate sterile; filaments free, rather thick, inserted on margin of disk; anthers versatile, 1-celled; dehiscence longitudinal, extrorse. *Carpels* 3, connate in a stipitate 1-locular ovary with 3 parietal placentas; style slender tubular, stigma truncate, perforated; ovules many, 2-seriate on each placenta, pendulous, anatropus, with raphe ventral. *Fruit* a 1-celled loculicidally 3-valved capsule, corky and pitted within. *Seeds* many in the depressions of the valves, winged or wingless; albumen 0; embryo straight.

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213. Moringa Lamk.

The only genus. Characters those of the Order.

408. Moringa pterygosperma Gaertn.; F. B. I. ii. 45; E. D. M. 721. *Hyperanthera Moringa* F. I. ii. 368.

In all the provinces, planted; but often also self-sown. A small tree with corky bark, soft wood, and pungent root. *Beng. Hind.* and *Uriya* Sajina; *Kol.* Mulgia; *Santal.* Munga arak'.

II.—CALYCIFLORÆ.

Sepals connate, partially or completely, in a tube adnate to or enclosing the ovary, persistent or with the upper portion deciduous, very rarely free. *Disk* adnate to the calyx-tube and free from the ovary, or adnate both to ovary and calyx-tube, bearing the stamens on its apex; rarely epigynous and within the stamens. *Petals* isomerous with the sepals or sometimes fewer by suppression, inserted at the apex of the calyx-tube or on the disk lining the calyx, occasionally absent. *Stamens* variously indefinite or definite, inserted on the margin or inner face of the disk, rarely outside the epigynous disk. *Carpels* free or connate, usually inferior or enclosed in the calyx-tube.

Order XLV. CONNARACEÆ.

Shrubs, erect or climbing, or trees. *Leaves* persistent or deciduous, alternate, 1–3-foliolate or imparipinnate; leaflets coriaceous, entire; stipules 0. *Flowers* usually hermaphrodite, regular or somewhat irregular. *Disk* small annular, or imperfect, or 0. *Sepals* connate as a 5-lobed or 5-partite calyx, imbricate or valvate, generally persisting at the base of the fruit. *Petals* 5, imbricate or very rarely valvate, linear-oblong, free or slightly connate below. *Stamens* 10, occasionally declinate, alternately shorter and longer, sometimes 5, the shorter antipetalous series being imperfect, perigynous or hypogynous within the disk; filaments filiform, often connate below; anthers short, didymous; dehiscence longitudinal introrse, rarely after flowering extrorse by torsion. *Carpels* 5, rarely fewer or more, globose, free, hirsute, 1-locular; styles subulate or filiform, stigmas minutely capitate or 2-lobed or simple; ovules 2, collateral from inner angle at base of the loculus, ascending, orthotropous. *Fruit* of 1, rarely 2 or more, sessile or stalked, 1-, rarely 2-seeded follicles dehiscing by ventral suture. *Seed* erect, often with basal arillus; testa thick, sometimes fleshy below the middle; albumen fleshy or 0; embryo with amygdaloid cotyledons in exalbuminous, and with leafy cotyledons in albuminous seeds.

Calyx enlarging in fruit, clasping the base of the sessile capsule **Rourea.**
Calyx not accrescent, clasping the pedicel of the stipitate capsule **Connarus.**

214. **Rourea** Aubl.

Shrubs, sometimes scandent, or small trees, with odd-pinnate leaves; leaflets subopposite or alternate. *Flowers* small, in axillary panicles, on usually slender pedicels. *Sepals* connate in a short tube with deeply partite limb; lobes 5, orbicular, imbricate, enlarged and clasping the base of the fruit. *Petals* 5, usually linear-oblong, exceeding the calyx. *Stamens* 10; filaments filiform, alternately shorter and longer, connate in a ring at the base. *Carpels* 5, usually 4 imperfect and reduced to functionless styles, the fifth perfect with slender subulate style. *Fruit* a sessile follicle curved somewhat outwards, the base clasped by the hardened calyx-limb. *Seed* erect, arillate, with a split arillus; testa smooth, shining; embryo without albumen.

409. ROUREA COMMUTATA Planch.; F. B. I. ii. 47; E. D. R. 556.
Cnestis monadelpha F. I. ii. 454.
Tippera, Comilla; Chittagong.
A small tree. *Vernac.* Kowatothi.

215. **Connarus** Linn.

Trees or shrubs, with odd-pinnate or pinnately 3-foliolate leaves; leaflets opposite. *Flowers* small, in axillary panicles rarely simple racemes, on slender pedicels. *Sepals* connate in a short tube, limb deeply partite; lobes 5, oblong, slightly imbricate, not much or at all enlarging, spreading, not clasping the base of the fruit. *Petals* 5, linear-oblong, exceeding the calyx-lobes. *Stamens* 10; filaments filiform, alternately shorter and longer, the shorter casually with functionless anthers, connate below in a ring. *Carpels* 5, usually 4 imperfect, minute or suppressed, the fifth ovate with subulate style. *Fruit* a stipitate follicle, enlarged upwards. *Seed* solitary, arillate; testa smooth, shining; albumen 0.

410. CONNARUS PANICULATUS Roxb.; F. I. iii. 139; F. B. I. ii. 52; E. D. c. 1773.
Chittagong.
A large climber.

Order XLVI. LEGUMINOSÆ.

Herbs, shrubs, or trees. *Leaves* alternate rarely opposite, usually compound rarely simple, 1-foliolate, or pinnately 3-foliolate or odd- or even-pinnate, less often digitately 3- or more foliolate, rachis sometimes ending in a tendril, occasionally in a spine, occasionally leaf-like; stipules 2, usually free, rarely minute, leaflets often stipellate. *Flowers* usually irregular, hermaphrodite, rarely regular or polygamous, in axillary leaf-opposed or terminal racemes or panicles, rarely solitary, bracteate and usually 2-bracteolate. *Disk* adnate to calyx-tube. *Sepals* 5, usually connate, rarely free, often unequal, sometimes forming a 2-labiate calyx. *Petals* 5, rarely fewer by abortion, usually free and unequal. *Stamens* 10, perigynous or sub-hypogynous, rarely fewer by arrest, sometimes indefinite; filaments free or variously connate; anthers 2-celled; dehiscence usually longitudinal lateral. *Ovary* free, almost always a solitary carpel; style simple cylindric, usually declinate, stigma capitate terminal, or oblique introrse, very rarely extrorse; ovules usually several 2-seriate, rarely few or solitary, on the ventral suture, amphitropous or anatropous. *Fruit* usually a dry legume splitting along both sutures, less often a continuous indehiscent lomentum or separating into indehiscent 1-seeded joints; rarely a drupe. *Seeds* with a hard or leathery rarely membranous coat, occasionally with an arillus; albumen 0 or scanty, very rarely cartilaginous; embryo with fleshy or leafy cotyledons.

‡Flowers irregular; petals imbricate; stamens usually 10:—[p. 360]

*Calyx distinctly united below beyond the top of the disk; upper petal (standard) outermost; stamens very often 1-adelphous or 2-adelphous (9 + 1) [p. 360] ....Suborder **PAPILIONACEÆ.**

*Calyx divided into lobes (except in some *Bauhinias*) down to the top of the disk; upper petal innermost; stamens almost always free [p. 359] **Suborder CÆSALPINIEÆ.**

‡Flowers regular; petals valvate; stamens often indefinite [p. 359] **Suborder MIMOSEÆ.**

Suborder I. PAPILIONACEÆ.

Herbs, shrubs, or trees. *Leaves* simple or digitately or pinnately compound, rarely 2-pinnate; stipels very common. *Flowers* irregular, rarely almost regular, almost always hermaphrodite, never capitate, very rarely spicate. *Sepals* 5, united above the middle and beyond the disk in a campanulate or tubular calyx with truncate, 5-toothed or 5-lobed limb, often the two upper sepals connate and the limb 4-toothed, or the two upper and three lower discretely connate and the limb 2-lipped; rarely closed in bud and spathaceous in flower. *Petals* 5, imbricate, erect or spreading, the upper (standard) outmost, free or adnate below to stamens, the 2 lower (keel) inmost usually connate by their adjacent margins, the 2 lateral (wings) intermediate often attached in the middle to the keel; rarely the petals all erect, subequal, or reduced to one (standard). *Stamens* inserted with petals on the disk within the calyx-tube, usually 10, free, or more often 2-adelphous the 9 lower connate in a sheath the upper solitary free, rarely 2-adelphous in lateral bundles of 5 each, rarely 9 the upper absent, or 5 the stamens alternately imperfect and perfect, or 6 the intermediate alternate 4 of the sheath imperfect, very rarely numerous. *Carpel* free. *Seeds* usually with little or no albumen; embryo with usually accumbent cotyledons.

*Stamens 1- or 2-adelphous:—[p. 365]

  †Plants with basifixed hairs or glabrous; anthers not mucronate or gland-tipped:—[p. 365]

    ‡Pod dehiscent by both sutures:—[p. 363]

      §Leaf-rachis ending in a bristle or tendril; leaflets even-pinnate:—[p. 361]

        ¶Stems herbaceous; flowers axillary solitary, or racemed; stipules large foliaceous, oblique at base; stamens 10, 2-adelphous the vexillary stamen free, or 1-adelphous the vexillary stamen joined to sheath:—[p. 361]

          Style not bearded; wings free from staminal tube; leaflets toothed; seeds with a slender funicle; pod turgid [p. 361] **Cicer.

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**Style bearded; wings more or less united to staminal tube; leaflets entire; seeds with short funicle :—[p. 360]

Staminal tube oblique at the mouth; pod compressed :—

Style with dorsal tuft of hairs or bearded round tip; ovules usually more than 2 .... **Vicia.**

Style longitudinally bearded along inner face; ovules never more than 2 .... **Lens.**

Staminal tube truncate at mouth; style bearded along the inner face :—

Pod compressed; style flat, dilated at tip ......**Lathyrus.**

Pod turgid; style 3-cornered, dilated upwards throughout **Pisum.**

¶Stems woody; flowers in terminal racemes; stipules narrow, equal at base; stamens 9, 1-adelphous in a sheath slit above, vexillary 0; style not bearded; pod compressed [p. 360] **Abrus.**

§Leaf-rachis not ending in a tendril; leaves odd-pinnate or simple or digitately 3-more foliolate :—[p. 360]

Leaves simple or digitately compound :—

Stamens 1-adelphous, 10, sheath split along back, anthers 5 long and 5 on alternating short free filaments; leaves not glandular beneath :—

Pod compressed, seeds 1–2; leaves simple sessile **Heylandia.**

Pod turgid, seeds many; leaves simple sessile, or digitately 3–7 foliolate .... **Crotalaria.**

Stamens 2-adelphous, 9 + 1; seeds 2; leaves digitately 3-foliolate or petioled 1-foliolate, glandular beneath :—

Pod turgid; leaves digitately 3-foliolate, with bracts small, or 1-foliolate with bracts large; funicle centric **Flemingia.**

Pod depressed between the seeds; leaves (in our species) 1-foliolate with bracts small; funicle attached near end of hilum .... **Eriosema.**

Leaves pinnately compound :—

††Leaves pinnately 3-foliolate, or if 1-foliolate (*Grona*) with the leaves not glandular beneath :—[p. 363]

‡‡Pods dehiscing from apex to base :—[p. 363]

§§Leaves glandular beneath; pod compressed; stamens 9 + 1; the two upper calyx-lobes much connate; funicle centric :—[p. 362]

¶¶Ovules 1–2 :—[p. 362]

⊙Calyx-lobes accrescent, scarious-membranous, the lowest lobe largest [p. 362] .... **Cylista.**

⊙Calyx-lobes not accrescent, or if accrescent subequal and not scarious [p. 361] ....**Rhynchosia.**

¶¶Ovules 4 or more :—[p. 361]

Climbers; stigma small terminal :—

Pod linear-acuminate, hardly depressed between the seeds ....**Dunbaria.**

Pod oblong-obtuse, deeply transversely lineate between the seeds ....**Atylosia.**

Woody undershrubs; stigma dilated, oblique; pod acute, deeply transversely lineate between the seeds **Cajanus.**

§§Leaves not glandular beneath; leaflets stipellate :— p. 361]

Style bearded below the stigma; stamens 9 + 1 :—

Pod woody, septate between the velvety seeds; stigma oblique................................**Dysolobium.**

Pod coriaceous, not septate between the smooth seeds :—

Stigma oblique :—

Keel spirally twisted ....**Phaseolus.**

Keel not spiral :—

Style filiform ....**Vigna.**

Style flattened upwards ....**Pachyrhizus.**

Stigma terminal :—

Pod flattish, not winged ....**Dolichos.**

Pod square, 4-winged; stamens submonadelphous............................**Psophocarpus.**

Style not bearded below stigma :—

Nodes of racemes not swollen :—

Calyx-tube cylindric, with oblique truncate mouth; style dilated in the middle; standard erect **Dumasia.**

Calyx-tube campanulate, margin toothed, the 2 upper teeth subconnate; style uniform; standard reflexed :—

Stamens at length 2-adelphous; anthers all fertile ....**Glycine.**

Stamens persistently 1-adelphous; 5 alternate anthers sterile.............................**Teramnus.**

Nodes of racemes swollen :—

*Stamens 1-adelphous :—[p. 363]

Upper-lip of calyx projecting ....**Canavalia.**

Upper-lip of calyx not projecting :—

Pod oblong, turgid, 1–2-seeded; anthers 2-morphous, 4 sterile .... **Dioclea.**

Pod linear, flat or subcylindric, many-seeded; anthers uniform, sometimes sub-2-adelphous .... **Pueraria.**

*Stamens 2-adelphous (9 + 1) :—[p. 362]

Petals of equal length :—

Leaves 3-foliolate; upper lobe of calyx entire .... **Galactia.**

Leaves 1-foliolate; upper lobe of calyx 2-toothed...................................... **Grona.**

Petals very unequal :—

Anthers uniform; keel and wings both shorter than standard; armed trees; stamens submonadelphous ....**Erythrina.**

Anthers dimorphous; standard shorter than keel and wings; climbers...............**Mucuna.**

‡‡Pods dehiscing at seed-bearing apex only, elsewhere seedless and indehiscent:—[p. 361]

Petals unequal; flowers large ....**Butea.**

Petals subequal; flowers small ....**Spatholobus.**

††Leaves pinnately 5–many-foliolate; pods dehiscing from apex to base :—[p. 361]

Style bearded below the stigma; flowers with very unequal petals, standard large..**Clitoria.**

Style not bearded; flowers medium, the standard not longer than the other petals :—

Pods transversely septate between the seeds; stamens 2-adelphous (9 + 1) ....**Sesbania.**

Pods not septate; stamens submonadelphous, the vexillary stamen usually united in the middle to the edges of the sheath :—

Leaflets closely parallel-veined; pod thin, early dehiscent...**Tephrosia.**

Leaflets reticulately veined; pod thick, tardily dehiscent ....**Millettia.**

‡Pod indehiscent or rarely (some *Desmodia*) opening along the ventral suture :—[p. 360]

§Leaves not pellucid-dotted :—[p. 365]

=Pod not segmented, always indehiscent :—[p. 364]

×Leaves odd-pinnate :—[p. 364]

÷Trees or strong woody climbers; leaflets entire :—[p. 364]

Leaflets opposite, stamens usually submonadelphous the vexillary stamen united in the middle to the sheath, sometimes 2-adelphous (9 + 1) :—

Pod wingless ....**Pongamia.**

Pod winged ....**Derris.**

Leaflets distinctly alternate :—

Flowers small ; pods narrow ....**Dalbergia.**

Flowers medium ; pods suborbicular......**Pterocarpus.**

÷ Herbs ; leaflets with the veins produced as marginal teeth ; leaves always 3-foliolate :—[p. 363]

Pod subglobose, hardly longer than calyx ......**Melilotus.**

Pod flattened, much longer than calyx :—

Pod straight or curved, not spiral ....**Trigonella.**

Pod spirally twisted.................................**Medicago.**

× Leaves even-pinnate, the rachis ending in a bristle; herbs with hypogæal fruits [p. 363]..**Arachis.**

= Pod of 1 or several indehiscent 1-seeded segments; in some *Desmodia* dehiscing along the ventral suture :—[p. 363]

Leaves exstipellate :—

Stamens 1-adelphous, anthers dimorphous; leaves digitately 2–4-foliolate; joints of pod muricated, several............ **Zornia.**

Stamens 2-adelphous, anthers uniform :—

Stamens 9 in a sheath slit above with a free vexillary stamen ; leaves 1–3-foliolate :—

Stipules spinescent; leaves always simple; joints 9, pod hardly separating; vexillary stamen always free ...**Alhagi.**

Stipules not spinescent; leaves usually 3-foliolate, rarely 1-foliolate; pod a solitary 1-seeded flattened segment; vexillary stamen sometimes partially united to sheath **Lespedeza.**

Stamens in 2 lateral bundles of 5 each; leaves pinnate; joints of pod papillose or weakly muriculate :—

Leaves even-pinnate, end-leaflet replaced by a bristle; pod folded within the calyx ....**Smithia.**

Leaves odd-pinnate; pod straight exserted; marsh plants **Æschynomene.**

Leaves stipellate; stamens (9 + 1) diadelphous or submonadelphous; joints of pod usually about as long as broad :—

Ovary 1-ovuled; leaves 1-foliolate ....**Eleiotis.**

Ovary 2- or more-ovuled :—

+ Pod folded within the calyx :—[p. 365]

⊙ Calyx-teeth setaceous, not accrescent [p. 365] ...**Uraria.**

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⊙Calyx-teeth lanceolate, accrescent [p. 364] ....**Lourea.**

+Pod straight exserted :—[p. 364]

A tree; joints of pod thin, wing-like, large; flowers in fascicles from the old wood; stamens dimorphous **Ougeinia.**

Herbs, rarely shrubs; joints of pod not wing-like; flowers from the year's shoots; stamens uniform:—

Joints of pod thin or, if coriaceous, broader than thick; if as thick as broad much longer than broad; sometimes opening along lower suture....................**Desmodium.**

Joints of pod coriaceous, about as thick as they are broad and long ....**Alysicarpus.**

§Leaves pellucidly gland-dotted; leaflets 1 (in our species), their margins toothed; stamens 2-adelphous or submonadelphous; ovule 1; pod indehiscent [p. 363] ....**Psoralea.**

†Plants with hairs on twigs, leaves and calyx fixed by their centres; connective of anthers mucronate or gland-tipped :—[p. 360]

Stamens 1-adelphous, sheath tubular; pod thick; leaflets 3, large, toothed ....**Cyamopsis.**

Stamens 2-adelphous (9 + 1), sheath slit above; pod slender; leaflets usually small, entire; leaves simple or digitately or pinnately 3- or more-foliolate ....**Indigofera.**

*Stamens free :—[p. 360]

Leaves odd-pinnate; bracts and bracteoles small, caducous:—

Stigma terminal; pod long, moniliform ....**Sophora.**

Stigma oblique; pod short, turgid...............................**Ormosia.**

Leaves 1-foliolate; bracts and bracteoles large, opposite, persistent **Dalhousiea.**

216. Cicer Linn.

Annual herbs; with usually even-pinnate rigid *leaves;* leaflets and foliaceous stipules strongly veined and deeply toothed, the rachis ending in a bristle or tendril, sometimes in cultivated forms with a terminal leaflet; stipels 0. *Flowers* axillary solitary; bracts small; bracteoles 0. *Sepals* connate in an oblique tube; limb with 5 lanceolate subequal teeth. *Petals* exserted; standard broad narrowed to a wide claw, longer than wings and keel; wings obliquely obovate, free; keel incurved. *Stamens* 10, the vexillary one free, the others connate; anthers uniform. *Ovary* sessile, 2-many-ovuled, style filiform, incurved, beardless; stigma terminal, capitate. *Fruit* an oblong sessile turgid pod, narrowed into the persistent style. *Seeds* subglobose or irregularly obovoid; hilum small.

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411. CICER ARIETINUM Linn.; F. I. iii. 324; F. B. I. ii. 176; E. D. C. 1061.

Generally cultivated in Tirhut, Behar, N. and W. Bengal. A small herb. *Hind.* Chola, but, but kalia; *Beng.* Channa; *Santal.* But. The Gram or Chick-Pea.

217. **Vicia** Linn.

Annual or perennial herbs; *leaves* even-pinnate; rachis ending in a twisted tendril, rarely in a simple point; stipules semi-sagittate, stipels 0. *Flowers* subsessile axillary 1–3, or in peduncled axillary racemes; bracts small caducous, bracteoles 0. *Sepals* connate in a campanulate tube often oblique; lobes 5 subequal or the 2 upper shorter and the lowest longer than the lateral. *Petals* exserted; standard obovate emarginate, narrowed into a wide claw; wings oblong oblique, adnate in their middle to the shorter keel. *Stamens* 10, the vexillary one free or slightly connate with the rest; anthers uniform. *Ovary* subsessile or stipitate, usually many-ovuled, rarely 2-ovuled; style inflexed, filiform, or flattened, usually pubescent with a dorsal tuft or subapical ring of hairs, rarely glabrous; stigma terminal, capitate. *Fruit* a compressed pod, continuous within. *Seeds* globose, rarely compressed; hilum oblong or linear.

Stems prostrate; leaflets 4 or more pairs; rachis of leaf ending in a tendril:—
  Flowers solitary, almost sessile, large (·5 in.); pods glabrous, 6–18 seeded:—
    Leaflets wide, obtuse ....*sativa.*
    Leaflets narrower, those of lower leaves retuse *sativa* var. *angustifolia.*
  Flowers several in a peduncled raceme, small (·15 in.); pods shortly hairy, 2-seeded ....*hirsuta.*
Stems erect; leaflets 3 or fewer pairs; rachis of leaf ending in a simple point ....*Faba.*

412. VICIA SATIVA Linn.; F. I. iii. 323; F. B. I. ii. 178; E. D. V. 114.

Sometimes cultivated.

A small herb. *Hind.* and *Beng.* Ankari. The Tare.

412/2. Var. ANGUSTIFOLIA; E. D. V. 114.

General throughout the area.

A small prostrate or climbing herb.

CSL

413. Vicia hirsuta Koch; F. B. I. ii. 177; E. D. v. 112. *Ervum hirsutum* F. I. ii. 323.

A general field-weed.

A small prostrate herb. *Beng.* Musur-channa; *Hind.* Shunjhuni-ankari; *Santal.* Tiririte.

414. Vicia Faba Linn.; F. I. iii. 323; F. B. I. ii. 179; E. D. v. 108.

Occasionally in gardens, especially in Tirhut and N. Bengal.

An erect herb. *Hind.* Bakla, anhuri. The Bean.

218. **Lens** Gren. & Godr.

Annual herbs, erect or subscandent; *leaves* usually even-pinnate, the rachis ending in a tendril or a simple point occasionally with a terminal leaflet; stipules semisagittate, stipels 0. *Flowers* axillary, peduncled, solitary, or in few-fld. racemes; bracts and bracteoles usually 0. *Sepals* connate in an oblique tube; lobes 5, elongate, subequal. *Petals* exserted; standard broad, narrowed to a very short, wide claw; wings oblong, oblique, adnate in their middle to the shorter keel. *Stamens* 10, the vexillary one free, the others connate in an oblique sheath; anthers uniform. *Ovary* subsessile, 2-ovuled; style inflexed, bearded longitudinally on the inner face; stigma terminal. *Fruit* a compressed 1–2-seeded pod, continuous within. *Seeds* compressed, lenticular; hilum ovate or oblong.

415. Lens esculenta Moench; E. D. L. 252. *Cicer Lens* F. I. iii. 324. *Ervum Lens* F. B. I. ii. 179.

Cultivated, especially in northern and western parts, also in Chittagong. *Vernac.* Masuri, masur. The Lentil.

219. **Lathyrus** Linn.

Annual or perennial herbs with even-pinnate *leaves*, the rachis ending in a tendril or bristle, sometimes wholly cirrhose; stipules leafy, sagittate or semisagittate; stipels 0. *Flowers* axillary, peduncled, solitary or racemed; bracts usually minute, caducous, bracteoles 0. *Sepals* connate in an obliquely campanulate tube sometimes gibbous behind; teeth 5, subequal or the 2 upper shorter. *Petals* more or less exserted; standard broad, narrowed to a short, wide claw; wings falcate, obovate or oblong, slightly adnate in their middle to the shorter incurved keel, or occasionally free. *Stamens* 10, the vexillary one free or more or less connate with the others, which are united in a sheath with a straight mouth; anthers uniform. *Ovary* subsessile or stipitate, many-ovuled; style dorsally flattened, bearded longitudinally on the inner side; stigma terminal, capitate. *Fruit* a subterete or compressed pod, continuous within, several-seeded. *Seeds* globose or angled, rarely compressed; hilum small or linear.

Leaves reduced to tendrils; stipules large ovate, leaflike; flowers yellow *Aphaca.*

Leaves pinnate, with 1–2 pairs of leaflets; stipules small semisagittate; flowers blue or sometimes white ....*sativus.*

416. LATHYRUS APHACA Linn.; F. I. iii. 322; F. B. I. ii. 179; E. D. L. 96.

A general, but not common, field-weed.

A small herb with leafy stipules. *Beng.* Jangli mátár, Masur-channa.

417. LATHYRUS SATIVUS Linn.; F. I. iii. 322; F. B. I. ii. 179; E. D. L. 100.

Generally cultivated.

An annual herb. *Vernac.* Kesári, kassur.

220. Pisum Linn.

Herbs, diffuse or climbing; *leaves* even-pinnate; leaflets 1–3-pairs; rachis ending in a simple or branched tendril or a simple point; stipules foliaceous, semicordate or semisagittate, stipels 0. *Flowers* axillary peduncled, showy, solitary or in few-fld. racemes; bracts very small caducous, bracteoles 0. *Sepals* connate in an oblique tube sometimes gibbous behind; lobes 5, subequal or the 2 upper wider. *Petals* much exserted; standard very broad, narrowed to a short, wide claw; wings oblong falcate, adnate in their middle to the shorter incurved obtuse keel. *Stamens* 10, the vexillary filament free or connate by its middle with the rest, the sheath of which is scarcely oblique; anthers uniform. *Ovary* subsessile, many-ovuled; style inflexed, hard, dilated with reflexed edges, compressed laterally towards the top and there longitudinally bearded on the inner side. *Fruit* an obliquely pointed compressed or subturgid pod, continuous within, several-seeded. *Seeds* subglobose; hilum oblong.

*Standard white or pale violet, wings and keel purple; seeds depressed, angular, grey or purple, mottled; point of attachment of stipules pink [p. 369] .... *arvense.*

GSL

Standard, wings, and keel white; seeds rounded, green or pale straw-coloured; point of attachment of stipules pale green [p. 368]......*sativum*.

418. PISUM ARVENSE Linn.; F. B. I. ii. 181; E. D. P. 882.

Cultivated, especially in the northern and eastern parts.

An annual herb. *Vernac*. Mátár. The Field-pea.

419. PISUM SATIVUM Linn.; F. I. ii. 321; F. B. I. ii. 181; E. D. P. 885.

Cultivated, especially in the western parts.

An annual herb. *Beng*. Cabuli-mátár. The Pea.

221. Abrus Linn.

Shrubs or undershrubs, with twining stems; *leaves* even-pinnate; leaflets many-paired, subdeciduous; rachis ending in a simple point; stipules subscarious, striate, lanceolate, deciduous; stipels minute, blunt, persistent, rigid. *Flowers* small, distinctly pedicelled, racemosely fascicled on the nodes of terminal peduncles or on almost leafless, short, axillary branches; bracts small, ovate, acute, deciduous; bracteoles under the calyx 2, lanceolate, deciduous. *Sepals* 5, connate in a subtruncate tube, the teeth short, the upper 2 subconnate. *Petals* exserted; standard ovate narrowed to a short claw slightly adnate to the staminal tube; wings falcate, oblong, spreading, free, shorter than the curved keel. *Stamens* 9, connate in a sheath split along the top, the vexillary filament absent; free portions of filaments alternately longer and shorter; anthers uniform. *Ovary* subsessile, several- or many-ovuled; style short, incurved, not bearded; stigma terminal capitate. *Fruit* an oblong or linear pod, considerably or much compressed. *Seeds* globose or compressed; testa smooth, shining; hilum shortly oblong.

Pods twice to thrice as long as broad, fairly thick, somewhat corrugated; seeds rounded ....*precatorius*.

Pods four to five times as long as broad, thin, smooth; seeds compressed. *pulchellus*.

420. ABRUS PRECATORIUS Linn.; F. I. iii. 257; F. B. I. ii. 175; E. D. A. 51.

In all the provinces.

A slender climber. *Hind*. Gaunchi, rati, chirmiti; *Beng*. Kunch, chun-hati; *Santal*. Kawet.

421. ABRUS PULCHELLUS Wall.; F. B. I. ii. 175.

N. Bengal; E. Bengal; Tippera; Chittagong.

A slender climber.

222. Heylandia DC.

A prostrate herb ; *leaves* close-set, alternate, simple. *Flowers* small, axillary, solitary. *Sepals* connate in a turbinate tube ; teeth lanceolate, 3 lower longer than the 2 subconnate upper. *Petals* much exserted ; standard suborbicular with 2 basal scales at the top of the short claw ; wings short, obovate-oblong ; keel narrow, its petals connate, narrowed to an incurved beak. *Stamens* 10, united in a tube slit above ; anthers alternate, short versatile, and long basifixed. *Ovary* sessile, 2-ovuled ; style abruptly incurved at base, elongated, longitudinally bearded above ; stigma terminal. *Fruit* a flat oblong 1–2-seeded pod, continuous within. *Seeds* without strophiole ; funicle filiform.

422. HEYLANDIA LATEBROSA DC. ; F. B. I. ii. 65. *Crotalaria uniflora* F. I. iii. 271.
N. Bengal ; Tirhut.
A small weed.

223. Crotalaria Linn.

Herbs or shrubs ; *leaves* simple or digitately compound, often 3-foliolate, rarely 1- or 5–7-foliolate ; stipules free from petiole, sometimes decurrent on the stem, occasionally small or 0. *Flowers* often showy, in terminal or leaf-opposed racemes, rarely solitary ; bracts small or 0, rarely leafy ; bracteoles on pedicel or sometimes at calyx-base small, rarely 0. *Sepals* connate in a short tube ; teeth 5, linear or lanceolate, subequally discrete, or rarely the 2 upper or the 3 lower, or both, more or less connate as upper and lower lips, occasionally the 4 upper subconnate in lateral pairs. *Petals* as long as or exceeding calyx ; standard usually orbicular, with usually a single callosity above the short claw ; wings shorter, obovate-oblong ; keel broad, as long as wings, its petals connate, much incurved, markedly beaked. *Stamens* 10, connate in a sheath slit above ; anthers alternately short versatile, and long basifixed. *Ovary* sessile or rarely stipitate, 2–many-ovuled ; style much incurved, often abruptly inflexed, more or less bearded longitudinally above ; stigma oblique, small. *Fruit* a globose or oblong very turgid or inflated pod, continuous within. *Seeds* small, without strophiole ; funicle filiform.

*Leaves digitately compound :—[p. 371]

Leaflets almost always 5, sometimes 7, very rarely 3, narrowly linear

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or oblanceolate, obtuse; pod glabrous many-seeded, cylindric, shortly stalked ....*quinquefolia.*

Leaflets always 3, ovate or oblong:—

Pods oblong or cylindric, many-seeded:—

Erect, shrubby; bracts minute setaceous; pods large:—

Pods pubescent, subsessile:—

Leaflets obovate, obtuse; pod loosely pubescent.........*incana.*

Leaflets oblong, acute; pod densely pubescent ......*bracteata.*

Pods glabrous:—

Pods subsessile:—

Leaflets oblong, acute ....*Brownei.*

Leaflets obovate, obtuse ....*Saltiana.*

Pods with a long, slender, filiform gynophore; leaflets obovate-oblong acute ....*laburnifolia.*

Prostrate, diffuse, herbaceous; bracts conspicuous, foliaceous, persistent; pods small, glabrous, long-stalked...........*orixensis.*

Pods small obliquely subglobose, 2-seeded; leaflets small oblanceolate; bracts linear minute ....*medicaginea* var. *neglecta.*

*Leaves simple:—[p. 370]

Stipules persisting as long decurrent wings along the twigs; pod linear-oblong, many-seeded, stipitate, glabrous.................................*alata.*

Stipules, if present at all, not decurrent along the twigs:—

Erect shrubs or herbs; seeds 10–20:—

Shrubs with strict, erect branches; racemes both terminal and lateral; pods pubescent or velvety:—

Leaves ovate; branchlets angular; stipules foliaceous semilunar, large; flowers usually blue and white ....*verrucosa.*

Leaves lanceolate or linear; stipules minute or 0; flowers yellow:—

Branchlets angular; leaves acuminate; pod shortly stalked *tetragona.*

Branchlets rounded, grooved; leaves obtuse; pod sessile *juncea.*

Herbs with stout, unbranched stems; racemes terminal only; pods glabrous:—

Stipules subulate, minute; bracts deciduous; leaves obtuse *retusa.*

Stipules foliaceous, leafy; bracts reflexed persistent; leaves acute *sericea.*

Diffuse low herbs, or rarely shrubs; stipules small or 0:—

†Low annuals or almost stemless shrubs with many ascending branches and terminal racemes; corolla hardly, if at all, exserted:—[p. 372]

Pods obviously exserted from calyx :—

Stipules linear, persistent; bracts lanceolate, foliaceous; leaves linear-oblong, obtuse; pods subsessile, glabrous ...*mysorensis*.

Stipules 0 :—

Pods silky; bracts minute, lanceolate; leaves linear, very small; annual, densely silky herbs ....*pusilla*.

Pods glabrous :—

Bracts lanceolate, foliaceous; leaves linear, obtuse; annual, finely hairy herbs ....*hirta*.

Bracts linear, very minute; leaves linear or oblanceolate, obtuse; perennial, obscurely silky, slender plants...*albida*.

Pods included in calyx, glabrous; annual herbs :—

Stipules 0; upper calyx-teeth connate; bracts and bracteoles very minute; leaves linear or oblanceolate, obtuse :—

Racemes capitate or subumbellate ....*nana* var. *patula*.

Racemes elongated, lax ....*linifolia*.

Stipules minute, setaceous; calyx-teeth all elongated; bracts and bracteoles long :—

Flowers in densely congested rounded heads; bracts and bracteoles broad, ovate-acute; leaves obovate, cuneate, subacute ....*dubia*.

Flowers in lax or elongated racemes; bracts and bracteoles narrow; leaves linear or lanceolate :—

Racemes elongated; flowers close, blueish, usually numerous; bracts and bracteoles setaceous............*sessiliflora*.

Racemes short; flowers lax, yellow, always few, bracts and bracteoles lanceolate ....*calycina*.

†Prostrate herbs with flexuous, trailing stems; flowers lateral, solitary or in few-flowered racemes :—[p. 371]

Pods silky :—

Corolla hardly exserted; pods finely silky, at length glabrescent, subglobose; stipules very minute or 0 ....*globulosa*.

Corolla distinctly exserted; pods finely downy, oblong; stipules small, linear ....*hirsuta*.

Pods glabrous :—

Stipules 0 :—

Leaves obliquely cordate; pod short-stalked ......*trichophora*.

Leaves obovate-oblong; pod subsessile.................*prostrata*.

Stipules present :—

Stipules small, lanceolate; bracts deflexed; pods sessile ·25–·35 in. long..*acicularis*.

Stipules foliaceous, persistent, often deflexed; bracts spreading; pods shortly stalked, 1–1·25 in. long. ....*ferruginea*

423. Crotalaria quinquefolia Linn.; F. I. iii. 279; F. B. I. ii. 84.
Behar; N. Bengal; Chota Nagpur.
An erect annual, 2–4 feet high.

424. Crotalaria incana Linn.; F. B. I. ii. 83.
Cultivated, also at times an escape, especially in Chittagong.
An undershrub, 2–4 feet high.

425. Crotalaria bracteata Roxb.; F. I. iii. 278; F. B. I. ii. 83.
Chittagong.
A small shrubby species.

426. Crotalaria Brownei Bert. *C. striata* F. B. I. ii. 84 partly.
Cultivated and also in some places naturalised.

427. Crotalaria Saltiana Andr. *C. striata* F. B. I. ii. 84 partly; E. D. c. 2159.
Throughout Bengal, including the Sundribuns; and in Chittagong.
A roadside weed, probably introduced during the last century. *Santal.* Çan janka.

428. Crotalaria laburnifolia Linn.; F. I. iii. 275; F. I. ii. 84; E. D. c. 2148.
E. Bengal.
A low shrub. *Hind.* Muna.

429. Crotalaria orixensis Rottl.; F. I. iii. 276; F. B. I. ii. 83.
Behar; Orissa.
A diffuse herbaceous perennial with slender, much-branched stems.

430. Crotalaria medicaginea DC. var. neglecta Bak.; F. B. I. ii. 81. *C. procumbens* F. I. iii. 278 partly. E. D. c. 2151.
Chota Nagpur.
A diffuse perennial with slender ascending stems.

431. Crotalaria alata Ham.; F. I. iii. 274; F. B. I. ii. 69.
Bengal; Behar; Chota Nagpur.
An undershrub.

432. Crotalaria verrucosa Linn.; F. B. I. ii. 77. *C. angulosa* F. I. iii. 273.

Orissa; C. Bengal; Sundribuns; Chittagong.
A subherbaceous undershrub. *Vernac.* Ban-çan.

433. CROTALARIA TETRAGONA Roxb.; F. I. iii. 263; F. B. I. ii. 78.
Chittagong.
A stiff shrub, 6 feet high, with dark-brown velvety pods.

434. CROTALARIA JUNCEA Linn.; F. I. iii. 259; F. B. I. ii. 79; E. D. C. 2105.
Cultivated generally and sometimes spontaneous.
A rigid shrub. *Vernac.* "Sunn," Çan.

435. CROTALARIA RETUSA Linn.; F. I. iii. 272; F. B. I. ii. 75; E. D. C. 2155.
C. Bengal; Sundribuns.
A robust herbaceous undershrub, 3–4 feet high. *Beng.* Bhil-jhanjhan.

436. CROTALARIA SERICEA Retz; F. I. iii. 273; F. B. I. ii. 75; E. D. C. 2157.
Chota Nagpur; N. and E. Bengal; Chittagong.
A robust herbaceous undershrub, 3–4 feet high. *Beng.* Pipali-jhanjhan.

437. CROTALARIA MYSORENSIS Roth; F. B. I. ii. 70. *C. stipulacea* F. I. iii. 264.
C. and W. Bengal; Chota Nagpur.
A much-branched herb; stems 1–2 feet, with long dense spreading hairs.

438. CROTALARIA PUSILLA Heyne; F. B. I. ii. 70.
Behar.
A small herb, with stems 6 in. high.

439. CROTALARIA HIRTA Willd.; F. B. I. ii. 70. *C. chinensis* F. I. iii. 268.
W. Bengal; Behar.
A diffuse annual herb.

440. CROTALARIA ALBIDA Heyne; F. B. I. ii. 71. *C. montana* F. I. iii. 265.
Chota Nagpur, common; Behar; W. Bengal.
A small undershrub or shrub, 1–2 feet high.

441. CROTALARIA NANA Burm. var. PATULA Bak.; F. B. I. ii. 71.
C. Bengal, but probably introduced from Burma.
An annual, stems 6–8 in. high.

442. CROTALARIA LINIFOLIA Linn. f.; F. I. iii. 266; F. B. I. ii. 72.

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Behar; Chota Nagpur.
An annual, stems 8–20 in. high.

443. CROTALARIA DUBIA Grah.; F. B. I. ii. 73.
Chittagong.
Stems 1–2 feet high, sometimes not branched.

444. CROTALARIA SESSILIFLORA Linn.; F. B. I. ii. 73.
E. Bengal.
Stems 1–2 feet high.

445. CROTALARIA CALYCINA Schrank; F. B. I. ii. 72. *C. stricta* F. I. iii. 265.
Chota Nagpur; Behar; E. Bengal.
Stems 8–20 in. high; calyx densely covered with long, silky, brown hairs.

446. CROTALARIA GLOBULOSA Wight. *C. globosa* F. B. I. ii. 66.
Behar, rare.
A trailing annual, stems 1–2 feet long.

447. CROTALARIA HIRSUTA Willd.; F. I. iii. 270; F. B. I. ii. 68.
Behar.
Stems 1–2 feet long, diffuse, much branched.

448. CROTALARIA TRICHOPHORA Benth.; F. B. I. ii. 67.
Behar, rare.
Stems 1–2 feet long, very slender, much branched.

449. CROTALARIA PROSTRATA Roxb.; F. I. iii. 270; F. B. I. ii. 67; E. D. C. 2153.
Behar; Chota Nagpur; Bengal generally.
A diffuse herb, with slender stems 6–20 in. long. *Beng.* Chhoto-jhanjhan; *Santal.* Nanha or katic' junkha.

450. CROTALARIA ACICULARIS Ham.; F. B. I. ii. 68.
In all the provinces.
A diffuse herb, with slender stems 6–20 in. long.

451. CROTALARIA FERRUGINEA Grah.; F. B. I. ii. 68.
Chittagong.
A diffuse herb, with rather stout stems and silky branches.

224. **Flemingia** Roxb.

Undershrubs or shrubs, erect or prostrate, rarely herbs; *leaves* 1-foliolate or oftener digitately 3-foliolate, gland-dotted beneath; stipules striate, often deciduous; stipels 0. *Flowers* spicately or subcapitately racemose, or panicled; bracts large foliaceous, or narrow striate, persistent or caducous; bracteoles 0. *Sepals*

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connate in a very short tube; teeth 5, lanceolate, subequal or the lowest longest. *Petals* slightly or hardly exserted, subequal in length; standard obovate or orbicular, 2-auriculate at base; wings obliquely obovate or oblong, adnate to the straight or incurved obtuse or acute keel. *Stamens* 10, the vexillary filament free, the rest connate; anthers uniform. *Ovary* subsessile, short, 2-ovuled; style filiform or slightly thickened upwards, beardless; stigma terminal, capitate. *Fruit* a small oblong turgid, usually 2-seeded pod, continuous within. *Seeds* rather thick, not strophiolate; hilum small.

- Bracts large, persistent:—
  - Leaves simple; flowers in small cymes, each hidden by a broadly cordate folded membranous bract; cymes in copious panicles in the axils of leaves and at the ends of branches:—
    - Axis of racemes zigzag; bracts hardly broader than long:—
      - Erect shrubs, 5–10 feet high; leaves oblong or ovate-lanceolate, rounded at the base; bracts ·75–1 in. long:—
        - Lateral nerves all subequal, 8–10 pairs; bracts 1 in., finely puberulous, usually all obscurely cuspidate, sometimes the highest slightly emarginate ....*strobilifera.*
        - Lateral nerves 4–6 pairs, the basal pair longer, stronger and more oblique than the rest; bracts ·75 in., softly hirsute with long hairs, usually all slightly emarginate, sometimes the lowest obscurely cupidate ....*bracteata.*
      - Low shrubs, 1–3 feet high; leaves lanceolate with cuneate base; bracts ·4 in. long, softly pubescent with long spreading white hairs, all emarginate ....*fluminalis.*
    - Axis of racemes straight; erect shrubs, 5–10 feet high; leaves rounded cordate; bracts deeply emarginate, firm, much broader than long *Chappar.*
  - Leaves digitately 3-foliolate; flowers in dense globose heads surrounded by a ring of lanceolate acuminate scarious bracts ....*involucrata.*
- Bracts small, caducous:—
  - Leaves simple, thin; flowers in lax panicles single or fascicled in leaf-axils and thyrsoid at ends of branches ....*paniculata.*
  - Leaves digitately 3-foliolate:—
    - Flowers in copious axillary and terminal lax panicles; leaflets oblanceolate-oblong, obtuse, deeply plicate ....*lineata.*
    - Flowers in dense subspicate axillary racemes; leaflets acute:—
      - *Erect woody shrubs with distinct aboveground stems:—[p. 377]
        - †Bracts rigidly scarious; leaflets long-acuminate:—[p. 377]

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Branches and stems distinctly 3-cornered; bracts much exceeding the buds .... *stricta.*
Branches rounded, stems slightly 3-cornered; bracts hardly exceeding the buds .... *præcox.*

†Bracts herbaceous; leaflets abruptly pointed or shortly acuminate:—[p. 376]
Racemes as long as leaves, petioles winged .... *semialata.*
Racemes shorter than petioles, which are not winged:—
Bracts and calyx sparsely grey-silky; shrubs, 5–10 feet high *congesta.*
Bracts and calyx adpressed-tawny-pubescent; diffuse undershrubs, 1–1·5 feet high.................................. *prostrata.*

*Dwarf shrubs with thick subterranean woody stems; leaflets very large, petioles very long [p. 376] .... *nana.*

452. Flemingia strobilifera R. Br.; F. B. I. ii. 227; E. D. F. 664. *Hedysarum strobiliferum* F. I. iii. 350.
Chota Nagpur; W. Bengal; Chittagong.
An erect shrub. *Santal.* Sim-busak.

453. Flemingia bracteata Wight. *F. strobilifera* var. *bracteata* F. B. I. ii. 227. *Hedysarum bracteatum* F. I. iii. 351.
Chota Nagpur.
An erect shrub.

454. Flemingia fluminalis Clarke.
Chittagong.
An undershrub.

455. Flemingia Chappar Ham.; F. B. I. ii. 227.
W. Bengal; Chota Nagpur; Orissa.
An erect shrub.

456. Flemingia involucrata Benth.; F. B. I. ii. 229.
E. Bengal, Mymensingh.
A small erect shrub.

457. Flemingia paniculata Wall.; F. B. I. ii. 227.
W. Bengal; Chota Nagpur.
An erect shrub.

458. Flemingia lineata Roxb.; F. I. iii. 341; F. B. I. ii. 228.
N. Bengal.
An erect shrub.

459. Flemingia stricta Roxb.; F. I. iii. 342; F. B. I. ii. 228.
Chota Nagpur; Chittagong.
A tall shrub.

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460. FLEMINGIA PRÆCOX C. B. Clarke.
Chittagong.
A shrub.

461. FLEMINGIA SEMIALATA Roxb.; F. I. iii. 338. *F. congesta* var. *semialata* F. B. I. ii. 229 partly.
Chota Nagpur.
A shrub, 5–10 feet high. *Santal.* Bir but.

462. FLEMINGIA CONGESTA Roxb.; F. I. iii. 340; F. B. I. ii. 228; E. D. F. 633.
N. Bengal; Chittagong; Tirhut.
A tall shrub. *Vernac.* Bara-salphan, bhalia.

463. FLEMINGIA PROSTRATA Roxb.; F. I. iii. 338. *F. congesta* var. *semialata* F. B. I. ii. 229 partly.
Chota Nagpur; N. Bengal; E. Bengal; Tippera.
A diffuse, suberect or prostrate shrub.

464. FLEMINGIA NANA Roxb.; F. I. iii. 339. *F. congesta* var. *nana* F. B. I. ii. 229 partly.
W. Bengal; Chota Nagpur.
Dwarf, with underground stems emitting shoots after jungle-fires. *Santal.* Ot' murup.

225. **Eriosema** DC.

Shrubs or herbs, mostly suberect, with 1–3-foliolate pinnate *leaves* rather inconspicuously gland-dotted beneath; stipules free or connate opposite the petiole, lanceolate. *Flowers* axillary racemed, solitary or geminate along the rachis, occasionally axillary solitary. *Sepals* connate in a campanulate tube; lobes 5, as long as the tube, subequal, or the two upper rather shorter and subconnate. *Petals* somewhat exserted; standard obovate or oblong, auricled at the base; wings narrow, as long as the obtuse incurved keel and shorter than the standard. *Stamens* 10, vexillary filament free, the rest connate; anthers uniform. *Ovary* sessile, 2-ovuled; style filiform, beardless; stigma terminal capitate. *Fruit* an oblong somewhat compressed pod, 1–2-seeded, continuous within. *Seeds* compressed oblique, without strophiole; funicle attached to the end of a linear hilum.

465. ERIOSEMA CHINENSE Vog.; F. B. I. ii. 219; E. D. E. 325.
Chota Nagpur.
A small shrubby plant, with slender stems from a perennial woody stock. *Santal.* Konden.

226. Cylista Ait.

A twining undershrub or shrub; *leaves* pinnately 3-foliolate, dotted beneath with resinous glands; stipules lanceolate, deciduous; stipels long, subulate, persistent. *Flowers* axillary racemose, pedicels short; bracts membranous, hyaline, large, deciduous; bracteoles 0. *Sepals* connate in a campanulate tube, the lobes obtuse, scarious, enlarging; lowest largest, concave, the lateral pair much shorter than the two upper almost completely connate in an emarginate lip. *Petals* included, subequal in length; standard suborbicular auriculate at the base; wings narrow; keel incurved, obtuse. *Stamens* 10, vexillary filament free, the others connate; anthers uniform. *Ovary* subsessile, 1-ovuled; style long filiform; stigma terminal capitate. *Fruit* a small, oblique pod, enclosed in the calyx, 1-seeded. *Seed* not strophiolate.

466. CYLISTA SCARIOSA Ait.; F. I. iii. 320; F. B. I. ii. 219.
Behar; W. Bengal; C. Bengal.
A woody climber.

227. Rhynchosia Lour.

Twining or erect herbs or shrubs; *leaves* pinnately rarely subdigitately 3-foliolate, dotted with resinous glands beneath; stipules ovate or lanceolate; stipels long subulate, or minute or 0. *Flowers* axillary, single or paired on the rachis of a raceme, rarely solitary; bracts caducous; bracteoles 0. *Sepals* united in a short tube, lobes as long as tube or exceeding it, not or very rarely slightly enlarged in fruit, subequal but the two upper more or less connate. *Petals* included or exserted, subequal in length; standard obovate or orbicular, spreading or reflexed, base auriculate; wings narrow; keel incurved, hardly beaked. *Stamens* 10, vexillary filament free, the rest connate; anthers uniform. *Ovary* subsessile, 2-ovuled, rarely 1-ovuled; style incurved filiform or thickened, beardless; stigma terminal capitate. *Fruit* a slightly or much compressed pod, oblong or round, continuous or septate within. *Seeds* 2, rarely 1, compressed orbicular or subreniform; hilum lateral short or oblong; funicle central; strophiole present or 0.

Calyx-lobes broad, obtuse, distinctly enlarged; stems suberect and shrubby; pod round, turgid, downy seeds arillate .... *rufescens*.
Calyx-lobes narrow, lanceolate-acuminate or setaceous;—

Seeds arillate :—

Dwarf undershrubs with flowers in peduncled pairs, peduncles shorter than the petioles ; pod turgid, downy, at length glabrescent, not lineate between the seeds ....*cana.*

Trailing herbs with flowers in close many-flowered racemes, peduncles longer than the leaves ; pod subcompressed, thinly beset with spreading hairs, faintly lineate between the seeds ....*capitata.*

Seeds not arillate ; twining herbs or shrubs ; pods turgid :—

Leaflets small, obtuse ; pod glabrescent, slightly recurved ; stems very slender ....*minima* var. *laxiflora.*

Leaflets large, acute ; pod pubescent or downy, straight ; stems rather short :—

Pubescence minutely glandular, not hoary ; end-leaflet deltoid, acute ; lower calyx-tooth not exceeding the tube ; pod finely pubescent ....*viscosa.*

Pubescence hoary, not glandular ; end-leaflet rounded, cuspidate :—

Lower calyx-tooth not exceeding tube ; pod finely pubescent *sericea.*

Lower calyx-tooth exceeding tube ; pod minutely downy *bracteata.*

467. RHYNCHOSIA RUFESCENS DC. ; F. B. I. ii. 220.

W. Bengal ; C. Bengal ; E. Bengal.

A shrubby species with long trailing shoots.

468. RHYNCHOSIA CANA DC. ; F. B. I. ii. 222.

Behar.

A small undershrub.

469. RHYNCHOSIA CAPITATA DC. *R. aurea* F. B. I. ii. 221 partly.

Behar.

A wide-trailing herb.

470. RHYNCHOSIA MINIMA DC. var. LAXIFLORA Bak. ; F. B. I. ii. 223 ; E. D. R. 346.

Chota Nagpur ; Behar ; W. Bengal.

A wide-trailing annual with very slender stems. *Hind.* Baunhran.

471. RHYNCHOSIA VISCOSA DC. ; F. B. I. ii. 225. *Dolichos glutinosus* F. I. iii. 312.

C. Bengal.

A wide-spreading climber with almost woody branches. *Beng.* Shim-bhatraji.

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472. RHYNCHOSIA SERICEA Span.; F. B. I. ii. 225.
C. Bengal.
A wide-spreading climber with woody branches.

473. RHYNCHOSIA BRACTEATA Benth.; F. B. I. ii. 225.
C. Bengal.
A large climber with woody grooved branches.

228. **Dunbaria** W. & A.

Prostrate or twining woody herbs; *leaves* pinnately 3-foliolate, distinctly glandular beneath stipules setaceous or lanceolate; stipels 0 or small. *Flowers* solitary or paired along the rachis of peduncled axillary racemes, nodes not tumid; rarely axillary solitary or paired; bracts usually membranous, deciduous; bracteoles 0. *Sepals* 5, connate in a rather short tube; lobes lanceolate acuminate, the lowest exceeding the rest, the two upper connate in an entire or 2-toothed lip. *Petals* exserted, sometimes marcescent; standard orbicular with 2-auriculate base; wings obliquely obovate or oblong; keel incurved, obtuse, rather shorter than the wings. *Stamens* 10; vexillary filament free, the others connate in a sheath; anthers uniform. *Ovary* sessile or stipitate, many-ovuled; style inflexed in the middle, filiform or slightly thickened, beardless; stigma terminal capitate. *Fruit* a linear flat pod, subseptate within, not depressed externally between the seeds. *Seeds* suborbicular; hilum short or oblong; funicle enlarged under the seed as a thickish membrane hardly becoming a strophiole.

Corolla much exserted, large, marcescent; stems stoutish, woody; branches at length glabrescent; racemes lax, longer than the leaves, pedicels retrofracted; pod beset with bristly hairs bulbous at their bases *glandulosa.*

Corolla little exserted, small, caducous; stems filiform; branches finely downy:—

Flowers many, in close subsessile racemes; pod distinctly stalked, clothed with fine spreading hairs ....*circinalis.*

Flowers 1-2, axillary, not or shortly peduncled; pod sessile, glabrous *conspersa.*

474. DUNBARIA GLANDULOSA Prain. *Atylosia rostrata* F. B. I. ii. 216.
E. Bengal, Mymensingh.
A stoutish woody-stemmed climber.

475. Dunbaria circinalis Bak.; F. B. I. ii. 219.
N. Bengal, Duars.
A slender woody climber.

476. Dunbaria conspersa Benth.; F. B. I. ii. 218.
N. Bengal, Duars.
A twining herb with very slender stems.

229. **Atylosia** W. & A.

Herbs or shrubs, twining or erect; *leaves* pinnately or occasionally subdigitately 3-foliolate; leaflets with resinous glands beneath; stipules lanceolate or setaceous, deciduous or not; stipels often 0. *Flowers* axillary fascicled, or in clustered racemes at the tips of axillary peduncles, occasionally the uppermost densely panicled; bracts usually large membranous caducous; bracteoles 0. *Sepals* 5, connate in a rather short tube; lobes longer or shorter than the tube, lanceolate-acuminate, the lowest longest, the 2 upper connate in an entire or 2-toothed lip. *Petals* exserted, sometimes marcescent; standard orbicular 2-auriculate at base; wings obliquely obovate or oblong; keel somewhat curved, obtuse. *Stamens* 10; vexillary filament free, the rest connate in a sheath; anthers uniform. *Ovary* sessile; ovules 3 or more; style filiform or slightly thickened, inflexed in the middle, beardless; stigma terminal capitate. *Fruit* a linear or oblong pod, septate within; valves transversely or obliquely depressed between the seeds. *Seeds* ovate or orbicular, conspicuously strophiolate.

Petals falling before the pod developes:—
  Flowers many, in long-peduncled racemes; leaflets minutely stipellate, leaf-rachis produced beyond lateral pair; pods with convex faces, narrowed at both ends, densely clothed with long spreading hairs *barbata*.
  Flowers few, shortly peduncled; leaflets without stipels; pods obtuse at both ends:—
    Rachis of leaf distinctly produced; pod lineate, flat, wide, thin, clothed with fine short deciduous hairs ....*platycarpa*.
    Rachis of leaf hardly produced; pod with convex faces, distinctly lineate, clothed with fine spreading silky hairs ....*scarabæoides*.
Petals persisting till the pod is developed; flowers in lax, peduncled racemes; pod with convex faces, distinctly lineate....................*crassa*.

477. Atylosia barbata Bak.; F. B. I. ii. 216.
E. Bengal; Chittagong.
A woody climber.

478. Atylosia platycarpa Benth.; F. B. I. ii. 216. *A. geminiflora* F. B. I. ii. 212.
Behar; Chota Nagpur.
A herbaceous climber.

479. Atylosia scarabæoides Benth.; F. B. I. ii. 215. *Dolichos scarabæoides* F. I. iii. 315; E. D. R. 347.
General.
A herbaceous biennial climber. *Beng.* Banur-kalai.

480. Atylosia crassa Prain. *A. mollis* F. B. I. ii. 213 partly.
Behar; Chota Nagpur.
A woody climber.

230. **Cajanus** DC.

Erect shrubs; *leaves* pinnately 3-foliolate, leaflets with minute resinous glands beneath; stipules small lanceolate deciduous; stipels 0. *Flowers* scattered on the rachis of axillary peduncled racemes; bracts caducous; bracteoles 0. *Sepals* 5, connate in a campanulate tube; lobes short, acute or acuminate, the two upper connate in a 2-toothed lip. *Petals* exserted; standard orbicular, 2-auriculate at base; wings obliquely obovate; keel obtuse, incurved at tip. *Stamens* 10; vexillary filament free, the rest connate in a sheath; anthers uniform. *Ovary* subsessile; ovules few; style long, somewhat thickened in upper half, beardless; stigma somewhat oblique, capitate. *Fruit* a linear, flat, obliquely acute pod, continuous within; valves with depressed oblique lines outside between the seeds. *Seeds* somewhat compressed, with oblong lateral hilum; strophiole 0.

481. Cajanus indicus Spreng.; F. B. I. ii. 217; E. D. C. 49. *Cytisus Cajan* F. I. iii. 325.
Cultivated everywhere.
An erect shrub. *Vernac.* Arhar. The Dal, or Pigeon-Pea.

231. **Dysolobium** Prain.

Twiners, sometimes large, usually woody; *leaves* pinnately trifoliolate; leaflets not glandular beneath; stipules lanceolate, basifixed, sometimes deciduous; stipels subulate, persistent. *Flowers* in copious axillary racemes; bracts and bracteoles deciduous, inconspicuous. *Sepals* 5, connate in a campanulate tube; lowest lobe lanceolate, exceeding the rest but shorter than the tube, the two

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upper connate entire or emarginate. *Petals* exserted; standard orbicular, subauriculate at base; wings oblong, adnate in the middle to the beaked, sometimes curved and laterally deflexed keel. *Stamens* 10; vexillary filament free, the rest connate in a sheath; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, bearded longitudinally or cæspitosely below the oblique stigma. *Fruit* a thick woody subterete pod, villous externally, very markedly septate with double partitions within. *Seeds* subglobose, velvety or hirsute; hilum lateral, small or oblong; strophiole 0.

Racemes lax, long-peduncled, flowers large; pods closely velvety-villous; seeds sparsely velvety; pod keeled along the suture but not winged:—
  Leaflets rounded, cuspidate, chartaceous, hirsute on nerves beneath; flowers 1·75 in. long; keel with a long laterally deflexed beak; style bearded down the face .... *grande.*
  Leaflets narrowed to apex, membranous, glabrescent; flowers ·6 in. long; beak of keel not deflexed; style penicillate round the stigma *lucens.*
Racemes dense, short-peduncled; flowers small, ·3 in. long or less; pods softly hirsute with long hairs; seeds densely velvety; beak of keel not deflexed:—
  Leaflets roundish cuspidate; pod neither keeled nor winged *dolichoides.*
  Leaflets lanceolate; pod subquadrangular, prominently winged along the angles .... *tetragonum.*

482. DYSOLOBIUM GRANDE Prain. *Phaseolus velutinus* F. B. I. ii. 204.
N. Bengal, Duars.
A large woody climber.

483. DYSOLOBIUM LUCENS Prain. *Vigna lucens* F. B. I. ii. 207.
Chittagong.
A large woody climber.

484. DYSOLOBIUM DOLICHOIDES Prain. *Phaseolus dolichoides* F. I. iii. 290. *Vigna dolichoides* F. B. I. ii. 206.
Chittagong.
A large climber.

485. DYSOLOBIUM TETRAGONUM Prain. *Psophocarpus* sp.; F. B. I. ii. 212.
N. Bengal, Duars.
A slender climber.

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232. **Phaseolus** Linn.

Herbs, rarely undershrubs, twining, rarely suberect; *leaves* pinnately 3-foliolate, leaflets eglandular; stipules membranous, lanceolate, small or conspicuous, basifixed or peltately attached; stipels subulate. *Flowers* fasciculately copiously racemose, peduncles axillary with rachis nodose; bracts and bracteoles often conspicuous, usually persistent. *Sepals* 5, connate in a campanulate tube; lowest tooth longer than the rest and sometimes exceeding the tube, the 2 upper subconnate or free. *Petals* exserted; standard orbicular, subauriculate at base; wings ovate or oblong, equalling or exceeding the standard, adnate to keel above the claw; keel prolonged in a beak to form a complete spiral. *Stamens* 10; vexillary filament thickened or appendaged above the base, free, the others connate in a sheath; anthers uniform. *Ovary* subsessile, many-ovuled; style enclosed in beak of keel and following its curvature, thickened upwards, usually longitudinally bearded below the oblique or introrse stigma. *Fruit* a linear or falcate compressed or subterete pod, chamber more or less septate or occluded between the seeds. *Seeds* thickish, smooth; hilum punctate or shortly linear; strophiole 0.

Stipules fixed by their bases; corolla never pure yellow (sometimes yellowish-green in *P. lunatus*):—
- Pods narrow, subcylindric, almost straight; flowers white and purple *semierectus*.
- Pod broad, subcompressed, recurved:—
  - Racemes dense, capitate; flowers white and purple; pods linear, 10–15-seeded ....*adenanthus*.
  - Racemes lax; pods 2–4-seeded:—
    - Pod oblong; flowers small yellowish-green or dirty white...*lunatus*.
    - Pods linear; flowers medium:—
      - Racemes shorter than the leaves; flowers lilac to white *vulgaris*.
      - Racemes as long as or exceeding the leaves; flowers scarlet or rarely pinkish-white ....*multiflorus*.

Stipules fixed peltately at or near their middle; corolla always pure yellow:—
- *Pods glabrous:—[p. 386]
  - †Pods cylindric; seeds rounded at ends; stems slender, diffuse; racemes subcapitate; leaflets distinctly shorter than petioles:—[p. 386]

Stipules oblong; leaflets shortly 3-lobed, the central lobe spathulate; stems almost glabrous ....*trilobus*.

Stipules lanceolate; leaflets deeply 3-lobed or dissected, the central lobe ligulate; stems hirsute ....*aconitifolius*.

†Pod somewhat compressed; seeds subtruncate at ends; stems twining, or in some cultivated forms of *P. calcaratus* erect; racemes subspicate; leaflets as long as petioles or longer:—[p. 385]

Flowers medium; seeds with a centric hilum ....*calcaratus*.

Flowers larger; seeds with hilum nearer one end ...*Ricciardianus*.

*Pods hirsute or pubescent, slightly compressed; racemes subcapitate:—[p. 385]

Stems and pods densely beset with rusty hairs; pods ascending, septate between the seeds; stems always twining ....*sublobatus*.

Stems and pods sparsely beset with grey tomentum; pods not septate between the seeds:—

Pods erect or suberect:—

Seeds black; stems subscandent ....*Mungo*.

Seeds grey; stems diffuse ....*Mungo* var. *Roxburghii*.

Pods spreading or reflexed:—

Seeds green; leaves dark-green; pods spreading horizontally *radiatus*.

Seeds yellow; leaves pale-green; pods distinctly reflexed *radiatus* var. *aurea*.

Seeds black; leaves medium-green; pods spreading horizontally *radiatus* var. *grandis*.

486. PHASEOLUS SEMIERECTUS Linn.; F. B. I. ii. 201.

C. Bengal.

A suberect shrubby species.

487. PHASEOLUS ADENANTHUS G. F. Mey.; F. B. I. ii. 200; E. D. P. 484. *P. alatus* F. I. iii. 288, not of Linn.

C. Bengal; banks of rivers and village jungles.

A perennial prostrate or climbing species. *Beng.* Ban barbati.

488. PHASEOLUS LUNATUS Linn.; F. I. iii. 217; F. B. I. ii. 200; E. D. P. 489.

C. Bengal; Orissa: cultivated.

A biennial or annual climbing species. *Beng.* Ban barbati; *Hind.* Karsam bali-pati.

489. PHASEOLUS VULGARIS Linn.; F. I. iii. 287; F. B. I. ii. 200; E. D. P. 530.

Cultivated.

Annual, climbing or suberect. French Bean. *Hind.* Bakla, loba.

490. Phaseolus multiflorus Willd.; F. B. I. ii. 200; E. D. p. 493.
Cultivated.
An annual climber. The Scarlet Runner.

491. Phaseolus trilobus Ait.; F. I. iii. 298; F. B. I. ii. 201; E. D. p. 523.
In all the provinces, wild.
A diffuse trailing herb. *Hind.* Rakhal-kalai, mugáni; *Beng.* Mugáni.

492. Phaseolus aconitifolius Jacq.; F. I. iii. 299: F. B. I. ii. 202; E. D. p. 468.
Chota Nagpur; Behar; Tirhut: cultivated.
A diffuse trailing herb. *Hind.* Moth; *Beng.* Kheri; *Santal.* Moch, bir-mung.

493. Phaseolus calcaratus Roxb.; F. I. iii. 289; F. B. I. ii. 203; E. D. p. 486.
Chota Nagpur; Behar; Tirhut; N. and E. Bengal.
A climber usually; sometimes suberect and short. *Hind.* Sutri, ghurúsh; *Santal.* Sutri.

494. Phaseolus Ricciardianus Ten.
Chittagong; cultivated.
A climber.

495. Phaseolus sublobatus Roxb.; F. I. iii. 288. *P. trinervius* F. B. I. ii. 203; E. D. p. 528.
Chota Nagpur; Western Behar.
A climber. *Beng.* Ghora-mung.

496. Phaseolus Mungo Linn.; E. D. p. 496.
In most of the provinces, cultivated.
A scandent or subscàndent herb. *Vernac.* Tikari-kalai.

496/2. Var. Roxburghii Prain. *P. radiatus* F. I. iii. 296, not of Linn. *P. Mungo* var. *radiatus* F. B. I. ii. 203.
In all the provinces, but especially the western ones, cultivated.
A diffuse but not scandent herb. *Vernac.* Urd, máshkalai.

497. Phaseolus radiatus Linn.; E. D. p. 513. *P. Mungo* F. I. iii. 292, not of Linn.; F. B. I. ii. 203 partly.
In all the provinces, cultivated.
A suberect herb. *Vernac.* Mung; hali-mung.

497/2. Var. AUREA Prain. *P. aureus* F. I. iii. 297. *P. Mungo* F. B. I. ii. 203, partly.

In all the provinces, cultivated.

A suberect herb. *Vernac.* Sonā-mung.

497/3. Var. GRANDIS Prain. *P. Max* F. I. iii. 295, not of Linn. *P. Mungo* F. B. I. ii. 203, partly.

In most of the provinces, occasional only.

A suberect or erect herb. *Vernac.* Krishna-mung.

233. **Vigna** Savi.

Herbs, rarely undershrubs, twining, rarely suberect; *leaves* pinnately 3-foliolate, leaflets eglandular; stipules membranous, lanceolate, basifixed, rarely peltately attached; stipels subulate. *Flowers* fasciculately racemed, peduncles axillary with rachis nodose; bracts and bracteoles small, deciduous. *Sepals* 5, connate in a campanulate tube; lowest tooth longer than the others, sometimes exceeding the tube, 2 upper subconnate or free. *Petals* exserted; standard orbicular, auriculate at base; wings falcate-oblong, rather shorter than standard, slightly adnate to the keel; keel about as long as wings, acute but with the beak not forming a complete spiral, or obtuse. *Stamens* 10; vexillary filament free, the rest connate in a sheath; anthers uniform. *Ovary* sessile, many-ovuled; style filiform or thickened or dilated upwards, longitudinally bearded below the oblique or introrse stigma. *Fruit* a linear subterete pod, the chamber occluded between the seeds. *Seeds* reniform or subquadrate, smooth; hilum short lateral; strophiole 0.

Keel prolonged into a distinct beak :—
  Flowers large (1–1·25 in.) purple; pods thinly silky at length glabrescent .... *vexillata.*
  Flowers medium (·6 in. or shorter); pods persistently pilose :—
    Flowers reddish; hairs on pods and stems spreading............ *pilosa.*
    Flowers yellow; hairs on pods adpressed, those on stems reflexed *Clarkei.*
Keel not beaked; pods glabrous :—
  Stipules basifixed; pods short, 6–12-seeded; a wild littoral species with twining stems and yellow flowers.............................. *luteola.*
  Stipules fixed above the base; pods long, 12–30-seeded; widely cultivated plants with white, pink, or yellowish flowers :—

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Stems suberect; pods with short spaces between the seeds...*Catjang.*
Stems twining; pods with very long intervals between the seeds
Catjang var. *sinensis.*

498. VIGNA VEXILLATA Benth.; F. B. I. ii. 206.
Behar; Chota Nagpur.
A climbing or trailing species with perennial fusiform rootstock and herbaceous stems.

499. VIGNA PILOSA Bak.; F. B. I. ii. 207; E. D. v. 129. *Dolichos pilosus* F. I. iii. 312.
Chittagong.
A climber with slender rigid stems. *Beng.* Jhikrai, malkonia.

500. VIGNA CLARKEI Prain.
N. Bengal, Duars.
A climber with slender rigid stems.

501. VIGNA LUTEOLA Benth.; F. B. I. ii. 205. *Dolichos gangeticus* F. I. iii. 310.
Sundribuns.
A twining or trailing littoral species.

502. VIGNA CATJANG Endl.; F. B. I. ii. 205; E. D. v. 116. *Dolichos Catjang* F. I. iii. 303.
In all the provinces, cultivated.
A suberect herb. *Hind.* Lobia, ransa; *Beng.* Barbati; *Santal.* Ghangra.

502/2. Var. SINENSIS Prain. *Dolichos sinensis* F. I. iii. 302.
In all the provinces, cultivated.
A climbing herb.

234. **Pachyrhizus** Rich.

Large herbaceous twiners with great tuberous rootstocks; *leaves* pinnately 3-foliolate; leaflets lobed, eglandular; stipules lanceolate, basifixed; stipels subulate. *Flowers* fascicled on the tumid nodes of long axillary peduncled racemes; bracts and bracteoles small setaceous, caducous. *Sepals* 5, connate in a campanulate tube; 3 lower teeth subequal acute, 2 upper connate in an emarginate lip. *Petals* much exserted, subequal; standard wide, obovate, 2-auriculate at base; wings oblong, falcate; keel incurved, obtuse. *Stamens* 10; vexillary filament free, the rest connate in a sheath; anthers uniform. *Ovary* subsessile, many-

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ovuled; style somewhat thickened and subcircinate upwards, longitudinally bearded below the introrse globose stigma. *Fruit* a linear turgid pod, occluded but not truly septate within, valves externally depressed between the seeds. *Seeds* ovate or suborbicular compressed; hilum small; strophiole 0.

503. Pachyrhizus angulatus Rich.; F. B. I. ii. 207; E. D. P. 1. *Dolichos bulbosus* F. I. iii. 309.

Cultivated, fairly generally.

A climber with somewhat woody stems, and a large tuberous root. *Beng.* Sankalu.

235. **Dolichos** Linn.

Herbs or undershrubs, twining prostrate or suberect; *leaves* pinnately 3-foliolate, leaflets eglandular; stipules small, subpersistent; stipels subulate. *Flowers* axillary, solitary or fascicled, or fasciculately racemed on axillary peduncles with nodes tumid or not; bracts and bracteoles minute, subpersistent. *Sepals* 5, connate in a campanulate tube; lobes very short, usually obtuse, the 2 upper connate in an entire or emarginate very short lip. *Petals* much exserted, usually subequal; standard orbicular, auriculate at base; wings falcate, obovate, adnate to keel; keel much incurved, often beaked, beak straight. *Stamens* 10; vexillary filament free, thickened or appendaged at base, the others connate in a sheath; anthers uniform. *Ovary* subsessile, many-ovuled; style thickened upwards and bearded longitudinally down the front, or filiform and bearded round the terminal stigma. *Fruit* a flat linear or oblong recurved pod, continuous within. *Seeds* thick or flattened; hilum short with slender funicle or elongated and covered by the thickened subpersistent apex of funicle.

Style clavate, thickened upwards, bearded along the inner face; pod oblong recurved, 2–4-seeded:—
  Pods tapering to the apex; seeds with long axis parallel to the sutures *Lablab.*
  Pods abruptly truncated at apex; seeds with long axis across the pods *Lablab* var. *lignosus.*
Style filiform throughout, penicillate round the stigma; pods linear:—
  Pods recurved, few-seeded; flowers 1–3, axillary ....*biflorus.*
  Pods straight or nearly so, many-seeded; flowers numerous, in peduncled racemes ....*subcarnosus.*

504. Dolichos Lablab Linn.; F. B. I. ii. 209 partly. *D. lignosus* F. I. iii. 307, not of Linn.
In all the provinces, cultivated.
Beng. Shim.

504/2. Var. lignosus Prain. *D. Lablab* F. I. iii. 305, not of Linn.; F. B. I. ii. 209 partly.
In all the provinces, cultivated.
Beng. Shim.

505. Dolichos biflorus Linn.; F. I. iii. 313; F. B. I. ii. 210.
Behar; Chota Nagpur.
A suberect or trailing or twining annual.
Hind. Kulti; *Beng.* Kurti-kalai; *Santal.* Horec'.

506. Dolichos subcarnosus W. & A.; F. B. I. ii. 211.
Chittagong, cultivated.
A climber.

236. Psophocarpus Neck.

Twining herbs, with large tuberous roots; *leaves* pinnately 3-foliolate; leaflets eglandular; stipules membranous, peltately fixed; stipels subulate. *Flowers* rather showy, fasciculately racemose towards the apex of axillary peduncles, nodes of rachis tumid; bracts small caducous; bracteoles larger, subpersistent. *Sepals* 5, connate in a campanulate tube; lowest lobe shorter than lateral, upper 2 connate, emarginate or bifid, all shorter than tube. *Petals* exserted; standard suborbicular; wings obliquely obovate; keel incurved at apex, obtuse. *Stamens* 10; vexillary filament free below and above, in the middle connate with the rest as a tube; anthers uniform. *Ovary* substipitate, many-ovuled; style long, thickened above ovary, laterally compressed, subulate, much incurved, densely penicillate round the terminal or subterminal globose stigma. *Fruit* a 4-angled pod with each angle distinctly winged, septate between the seeds. *Seeds* transversely oblong; hilum lateral oblong; strophiole 0.

507. Psophocarpus tetragonolobus DC.; F. B. I. ii. 211. *Dolichos tetragonolobus* F. I. iii. 305.
Chittagong.
A slender annual climber.

237. Dumasia DC.

Twining herbs; *leaves* pinnately 3-foliolate; leaflets eglandular; stipules setaceous or striate; stipels subulate. *Flowers* solitary or paired on the rachis of an axillary raceme; bracts narrow; bracteoles minute. *Sepals* 5, connate in a cylindric tube, gibbous at the base behind; limb obliquely truncate, teeth obsolete. *Petals* exserted, subequal; standard erect obovate, very slightly inflexed, auriculate at base; wings falcate-obovate, adnate to keel; keel obtuse, slightly incurved. *Stamens* 10; vexillary filament free, the rest connate in a sheath; anthers uniform. *Ovary* substipitate, many-ovuled; style erect and filiform below, dilated above the middle, the top subulate inflexed, beardless; stigma terminal, capitate. *Fruit* a linear falcate pod, compressed, continuous within, torulose opposite the seeds. *Seeds* subglobose; strophiole 0.

508. DUMASIA VILLOSA DC.; F. B. I. ii. 183.
Chota Nagpur, Parasnath.
A slender climber.

238. **Glycine** Linn.

Herbs, suberect or twining; *leaves* pinnately 3–7-foliolate; stipules small; stipels subulate. *Flowers* in axillary racemes, solitary or fascicled on the rachis; bracts small, setaceous; bracteoles minute. *Sepals* 5, connate in a campanulate tube; lobes equally distinct, or the two upper connate at the base or for half their length. *Petals* little exserted; standard suborbicular, hardly auriculate at base; wings narrow, slightly adnate to keel; keel obtuse, shorter than wings. *Stamens* 10, all connate, or the vexillary filament at length partially or quite free; anthers uniform. *Ovary* subsessile, many-ovuled; style short, incurved, beardless; stigma terminal capitate. *Fruit* a compressed or at length subterete, linear or falcate pod, spongily septate between the seeds. *Seeds* without strophiole.

509. GLYCINE HISPIDA Maxim. *G. Soja* F. B. I. ii. 184, not of Sieb. & Zucc. *Dolichos Soja* F. I. iii. 314.
W. Bengal, cultivated occasionally.
A suberect annual. *Beng.* Gari-kalai; *Hind.* Bhat, ram kurthi; *Santal.* Hende disom horec', pond disom horec'.

239. **Teramnus** Sw.

Twining herbs with slender stems; *leaves* pinnately 3-foliolate, leaflets eglandular; stipules small; stipels subulate. *Flowers* small, few, axillary fascicled or paired, or fascicled on the rachis of axillary racemes; bracts small; bracteoles linear or lanceolate, striate. *Sepals* 5, connate in a small campanulate tube; lobes subequal or the 2 upper shorter and distinct, or the 2 upper connate. *Petals* little exserted; standard obovate, narrowed at the base, not appendaged; wings narrow, adnate to keel; keel shorter than wings, almost straight, obtuse. *Stamens* 10, connate in a tube; anthers alternately perfect and very small sterile. *Ovary* sessile, many-ovuled; style short, thick, curved, beardless; stigma terminal, capitate. *Fruit* a linear flattish pod, septate within, tipped by the hooked persistent style. *Seeds* slightly oblong; hilum lateral small; strophiole 0.

Leaflets small, acute or subobtuse; racemes elongated, usually stalked:—

Leaflets membranous, sparsely hirsute; calyx-teeth as long as tube *labialis*.

Leaflets subcoriaceous, densely pubescent beneath; calyx-teeth shorter than tube .... *debilis*.

Leaflets large, acuminate or acute; racemes congested, sessile; calyx-teeth shorter than tube .... *flexilis*.

510. Teramnus labialis Spreng.; F. B. I. ii. 184. *Glycine labialis* F. I. iii. 318.

In all the provinces.

A slender twining species.

511. Teramnus debilis Prain. *T. labialis* var. *mollis* F. B. I. ii. 184. *Glycine delilis* F. I. iii. 318.

C. and E. Bengal.

A slender twining species.

Beng. Mashani.

512. Teramnus flexilis Benth.; F. B. I. ii. 185.

Sundribuns; Chittagong.

A rather robust twining species.

240. Canavalia DC.

Large twining or prostrate herbs; *leaves* pinnately 3-foliolate, leaflets eglandular; stipules small, sometimes wart-like or obsolete; stipels subulate. *Flowers* showy, in elongated peduncled axillary racemes, fascicled on a nodose rachis; bracts minute; bracteoles caducous. *Sepals* 5, connate in a tube; limb oblique 2-lipped, upper lip projecting entire or emarginate, lower shortly 3-toothed or entire, much smaller. *Petals* much exserted; standard large, suborbicular, reflexed; wings narrow, free from the wider obtuse or obtusely beaked keel. *Stamens* 10; vexillary filament free at the base, connate with others in a tube from the middle; anthers uniform. *Ovary* substipitate, many-ovuled; style incurved, beardless; stigma terminal minute. *Fruit* a large linear or oblong flattish pod, distinctly ribbed or subalate on each valve near the upper suture. *Seeds* ovate-rotund, subcompressed; hilum linear.

Pods not turgid, deeply double-channelled along the dorsal suture:—
  Pods 8–12-seeded, 1·5–2 in. wide; flowers rather numerous; leaflets ovate, acute ....*ensiformis.*
  Pods 4–6-seeded, ·5–·75 in. wide:—
    Flowers rather numerous; leaflets obovate, acute or obtuse ...*virosa.*
    Flowers few; leaflets orbicular, obtuse or retuse ....*lineata.*
Pods turgid, almost flat along the dorsal suture, endocarp separating, 4–6-seeded, 3·5–4·5 in. wide; leaflets ovate, acute or obtuse ...*obtusifolia.*

513. CANAVALIA ENSIFORMIS DC.; F. B. I. ii. 195; E. D. C. 289. *Dolichos gladiatus* F. I. iii. 300.
Generally cultivated.
A large climber. *Hind.* Kadsambal; *Beng.* Makhan-sim; *Santal.* Tihon.

514. CANAVALIA VIROSA W. & A. *C. ensiformis* var. *virosa* F. B. I. iii. 196; E. D. C. 290. *Dolichos virosus* F. I. iii. 301.
In most of the provinces.
A large climber. *Beng.* Kath-sim, kala-sim.

515. CANAVALIA LINEATA DC. *C. obtusifolia* F. I. ii. 196; E. D. C. 294. *Dolichos obcordatus* F. I. iii. 303.
Sundribuns, sea-face only; Orissa, along the coast.
A littoral species, creeping along the sand.

516. CANAVALIA OBTUSIFOLIA DC. *C. ensiformis* var. *turgida* F. B. I. ii. 196. *Dolichos rotundifolius* F. I. iii. 302.
Sundribuns and C. Bengal; a very common climber along the banks of tidal creeks and rivers.

241. **Dioclea** H.B.K.

Large climbing shrubs; *leaves* pinnately 3-foliolate; stipules lanceolate; stipels subulate. *Flowers* fasciculately racemose on thick elongated peduncles, rachis with thickened nodes; bracts and bracteoles lanceolate, membranous, caducous. *Sepals* 5, connate in a campanulate tube; the 2 upper lobes connate in an entire

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lip as long as tube, lateral lobes shorter, lowest rather longer than the upper lip. *Petals* somewhat exserted; standard orbicular or ovate, reflexed, auriculate at the base; wings obovate or oblong, free from the somewhat shorter, incurved, beaked or obtuse keel. *Stamens* 10; vexillary filament free below, connate from the middle with the rest, its anther perfect; anthers of the sheath uniform or alternately perfect and much shorter sterile. *Ovary* subsessile, 2- or more-ovuled; style incurved, beardless; stigma terminal, capitate. *Fruit* a linear or oblong pod, few-seeded, flattened or angled along the upper suture, occluded but not septate between the seeds. *Seeds* somewhat compressed; hilum short or linear; strophiole 0.

517. DIOCLEA JAVANICA Benth. *D. reflexa* F. B. I. ii. 196 partly. (*Dolichos hexandra* Roxb.)
Chittagong.
A rather slender woody climber.

242. Pueraria DC.

Twining or diffuse shrubs or herbs; *leaves* pinnately 3-foliolate; leaflets eglandular, sometimes lobed palmately; stipules herbaceous, usually basifixed, occasionally peltately attached; stipels subulate. *Flowers* purplish or blue, densely fasciculately racemose on long axillary peduncles, or subpaniculate near ends of branches; rachis nodose, nodes sometimes produced; bracts small, deciduous; bracteoles small subpersistent, or minute and caducous. *Sepals* 5, connate in a campanulate tube; teeth short or long, the 2 upper connate in an entire or 2-lobed lip. *Petals* distinctly exserted; standard obovate or suborbicular, auriculate at base; wings narrow, oblong or falcate, about as long as and adnate in the middle to the straight or curved keel. *Stamens* 10; vexillary filament free at the base, connate in the middle with the rest, rarely quite free; anthers uniform. *Ovary* subsessile, many-ovuled; style filiform, inflexed above, beardless; stigma terminal capitate. *Fruit* a linear, flattish pod, continuous or occluded or septate. *Seeds* flattish, suborbicular or transversely oblong; hilum shortly oblong; strophiole small, sometimes obsolete.

*Flowers produced when the plant is leafless; leaflets entire; pod wide, flat, somewhat constricted along the sutures between the seeds, tip straight:—[p. 396]

Calyx silky; teeth subobtuse, shorter than tube; bracts shorter than buds; pods bristly..........*tuberosa.*

Calyx subglabrous; teeth acute, as long as tube; bracts longer than buds; pods almost glabrous..........*Candollei.*

*Flowers produced along with the leaves; leaflets more or less 3-lobed; pod narrow, somewhat turgid, sutures straight, tip recurved:—[p. 395]

Leaflets shallow-lobed; flowers ·5 in. long; sutures of subcylindric pods not thickened ....*phaseoloides.*

Leaflets deeply lobed, larger; flowers 1 in. long; sutures of pods distinctly thickened, pods broader than thick..........*subspicata.*

518. PUERARIA TUBEROSA DC.; F. B. I. ii. 197; E. D. P. 1401. *Hedysarum tuberosum* F. I. iii. 363.

Chota Nagpur; Orissa.

A shrubby climber, with a large tuberous root. *Hind.* and *Santal.* Tirra, patral khonda; *Beng.* Shimia batraji.

519. PUERARIA CANDOLLEI Grah.; F. B. I. ii. 197.

Chittagong.

A shrubby climber.

520. PUERARIA PHASEOLOIDES Benth.; F. B. I. ii. 199 partly. *Dolichos phaseoloides* F. I. iii. 316.

N. Bengal; E. Bengal.

An extensive climber.

521. PUERARIA SUBSPICATA Benth. *P. phaseoloides* F. B. I. ii. 199 partly.

N. Bengal; Chittagong.

An extensive climber.

243. Galactia P. Br.

Prostrate or twining herbs; *leaves* 3-foliolate; stipules small, deciduous; stipels subulate. *Flowers* in axillary peduncled racemes, paired or fascicled on the swollen nodes of the rachis; bracts setaceous; bracteoles minute. *Sepals* 5, connate in a short tube; teeth lanceolate or linear, the 2 upper connate in an entire lip; buds acuminate. *Petals* not much exserted, about equal in length; standard ovate or orbicular, faintly auriculate at base; wings narrow, adnate to the obtuse almost straight keel. *Stamens* 10; vexillary filament free, connate in the middle with the rest; anthers uniform. *Ovary* subsessile, many-ovuled; style long, filiform, beardless; stigma terminal, capitate. *Fruit* a linear, usually recurved, flattened pod, occluded or subseptate between the seeds. *Seeds* somewhat compressed; strophiole 0.

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522. Galactia tenuiflora W. & A.; F. B. I. ii. 192. *Glycine tenuiflora* F. I. iii. 319.
Western Behar.
A slender twining herb.

Only var. *villosa* has been obtained within our area, and it appears to be very rare.

244. Grona Lour.

Twining herbs; *leaves* 1-foliolate; stipules caducous; stipels subulate. *Flowers* in axillary or subterminal racemes, 2–3 together on the slightly swollen nodes of the rachis. *Sepals* 5, connate in a short campanulate tube; teeth longer than tube, the 2 upper more or less united at the base. *Petals* exserted; standard obovate or suborbicular, auriculate at the base; wings falcate, slightly adnate to keel; keel obtusely beaked, nearly straight. *Stamens* 10; vexillary filament free, the rest connate; anthers uniform. *Ovary* subsessile, many-ovuled; style filiform, beardless; stigma terminal capitate. *Fruit* a linear compressed or somewhat turgid pod, occluded between the seeds. *Seeds* orbicular; hilum small; strophiole distinct.

523. Grona Grahami Benth.; F. B. I. ii. 191.
Chota Nagpur, Manbhum.
A lax, slender, trailing species.

245. Erythrina Linn.

Trees, rarely undershrubs, with prickly branches; *leaves* pinnately 3-foliolate, petioles sometimes prickly; stipules small; stipels gland-like. *Flowers* red, rarely white, in dense peduncled racemes that are axillary but appear before the leaves, or terminal, paired or fascicled on the rachis; bracts small; bracteoles small or 0. *Sepals* 5, connate in a spathaceous sheath split to the base behind with minutely toothed tip, or in a campanulate 2-lipped toothless calyx. *Petals* exserted, very unequal; standard long or wide, erect or spreading, sessile or long-clawed, base not auriculate; wings very short; keel short, its petals partly connate or free. *Stamens* 10; vexillary filament free or connate at base with the rest; the others connate to their middle; anthers uniform. *Ovary* stipitate, many-ovuled; style incurved, subulate at apex; stigma terminal capitate. *Fruit* a stipitate, linear-falcate pod, tapering at both extremities, seed-bearing throughout or at apex only, constricted or sinuate between the seeds ; dehiscence follicular throughout the dorsal suture or at the apex only. *Seeds* ovoid ; hilum lateral oblong ; strophiole 0.

Calyx spathaceous oblique, not at all 2-lipped, finally split to the base along the back ; tall trees :—

Calyx 5-cleft at the tip ; keel-petals free ; pod 6–8-seeded, distinctly torulose .... *indica*.

Calyx entire at the tip ; keel-petals connate ; pod 2–3-seeded, hardly torulose .... *stricta*.

Calyx campanulate, more or less distinctly 2-lipped, not splitting to the base down the back :—

Considerable trees :—

Leaflets as long as broad, pubescent beneath, their margins sinuate ; limb of standard 3–4 times as long as broad ; pod turgid *suberosa* var. *sublobata*.

Leaflets twice as long as broad, glabrous beneath, their margins entire ; limb of standard only as long as broad ; pod torulose *ovalifolia*.

Herb with annual twigs from a woody rootstock; leaflets entire, as long as broad .... *resupinata*.

524. ERYTHRINA INDICA Lamk ; F. I. iii. 249 ; F. B. I. ii. 188 ; E. D. E. 342.

Sundribuns, sea-face, wild ; elsewhere common but always planted.

An armed tree, with blackish prickles. *Beng.* Palita-mandar ; *Hind.* Mandara ; *Santal.* Marar baha.

525. ERYTHRINA STRICTA Roxb. ; F. I. iii. 251 ; F. B. I. ii. 189 ; E. D. E. 354.

Orissa, Khurda ; Chittagong.

An armed tree, with pale prickles. *Magh.* Katheik ; *Uriya* Chaldua.

526. ERYTHRINA SUBEROSA Roxb. var. SUBLOBATA Bak. ; F. B. I. ii. 190 ; E. D. E. 356. *E. sublobata* F. I. iii. 254.

Behar ; Chota Nagpur ; Orissa.

A tree with thick corky bark. *Uriya* Paldua.

527. ERYTHRINA OVALIFOLIA Roxb. ; F. I. iii. 254 ; F. B. I. ii. 189.

C. Bengal.

A tree with many prickles. *Beng.* Hari-kekra.

528. ERYTHRINA RESUPINATA Roxb. ; F. I. iii. 257 ; F. B. I. ii. 189.

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Chota Nagpur, Parasnath.

A dwarf species, the racemes and annual leafy shoots springing directly from a stout rootstock.

246. **Mucuna** Adans.

Perennial or annual large, twining shrubs or herbs; *leaves* pinnately 3-foliolate; stipules deciduous; stipels subulate, rarely 0. *Flowers* large, purple red or greenish, fasciculately racemed on usually long axillary peduncles, or occasionally subcymose, on a nodose rachis; bracts deciduous, large or small; bracteoles small. *Sepals* 5, connate in a widely campanulate tube; lowest tooth long, lateral short, upper 2 connate in an entire lip. *Petals* much exserted; standard complicate, shorter than the wings, auriculate at the base; wings oblong or ovate, usually adnate to keel; keel as long as or exceeding the wings, incurved, acute or beaked. *Stamens* 10; the vexillary filament free, the others connate in a split sheath, their anthers alternately longer basifixed, and shorter often versatile and bearded. *Ovary* sessile, villous, few- or many-ovuled; style filiform beardless; stigma terminal capitate. *Fruit* a woody or thickly leathery, ovate oblong or linear pod, usually beset with stinging hairs; externally variously winged or plaited or smooth, within septate or occluded. *Seeds* orbicular with long linear hilum, or transversely oblong with short hilum; strophiole 0.

Perennial woody climbers; seeds large, flat, with a large hilum extending round the greater portion of their circumference:—
  Pods with plaits across their faces, seeds solitary; racemes short corymbose...*monosperma*.
  Pods without plaits across their faces, seeds 2–4; racemes long-peduncled, umbelliform ....*gigantea*.
Stems aboveground annual; seeds small ovoid with a small lateral hilum; pods turgid, subrecurved at apex, longitudinally ribbed; racemes elongated:—
  Pods grey, covered with pungent deciduous hairs; flowers purple; leaves beneath grey-silky ....*pruriens*.
  Pods black, covered with velvety persistent tomentum:—
    Flowers purple; leaves beneath grey-silky ....*utilis*.
    Flowers white; leaves beneath glabrescent ....*nivea*.

529. Mucuna monosperma DC.; F. B. I. ii. 185; E. D. M. 781; *Carpopogon monospermum* F. I. iii. 283.

Tippera; Chittagong.

A large woody climber.

530. Mucuna gigantea DC.; F. B. I. ii. 186. *Carpopogon giganteum* F. I. iii. 286.

Sundribuns.

An extensive woody climber, confined to mangrove tidal forests.

531. Mucuna pruriens DC.; F. B. I. ii. 187; E. D. M. 786. *Carpopogon pruriens* F. I. iii. 283.

In all the provinces; common both on the edges of forests and in village jungles.

An annual climber with slender stems. *Beng.* Alkushi, bichchoti; *Hind.* Kivanch, goncha; *Uriya* Kaincho; *Santal.* Etka.

532. Mucuna utilis Wall.; F. B. I. ii. 187.

Occasionally cultivated, especially in the western provinces.

An annual climber with slender stems. In badly grown plants the racemes are often short and few-flowered, sometimes only 1–2 flowers being produced. *Beng.* Alkushi.

533. Mucuna nivea DC.; F. B. I. ii. 188. *Carpopogon niveum* F. I. iii. 285.

Occasionally cultivated.

An annual climber with slender stems. This and *M. utilis* are probably only varieties of the same species. *Beng.* Khamach.

247. **Butea** Roxb.

Trees or large woody twiners; *leaves* pinnately 3-foliolate, leaflets large; stipules small, caducous; stipels subulate. *Flowers* large, showy, densely fascicled in axillary or terminal racemes or panicles. *Sepals* 5, connate in a wide campanulate tube; teeth deltoid, short, the two upper connate in a broad entire or emarginate lip. *Petals* much exserted; standard ovate, acute, recurved, not appendaged at base; wings falcate, adnate to the much-incurved acute keel, which equals the standard in length. *Stamens* 10; vexillary filament free, filiform, the rest connate; anthers uniform. *Ovary* sessile or shortly stipitate, 2-ovuled; style long, incurved, beardless; stigma terminal, truncate or capitate. *Fruit* a firm oblong or widely ligulate follicle, the base flat, wing-like, and empty, the tip thick and splitting along the dorsal suture round the solitary seed. *Seed* obovate, somewhat compressed; hilum small, strophiole 0.

An erect tree; lower calyx-teeth deltoid ....*frondosa.*
A strong woody climber; lower calyx-teeth lanceolate; flowers nearly half as large again ....*superba.*

534. BUTEA FRONDOSA Roxb.; F. I. iii. 244; F. B. I. ii. 194; E. D. B. 944.

Behar; Chota Nagpur; W. Bengal.

A considerable tree. *Beng.* Palas; *Hind.* Dhak; *Santal.* Murup; *Kol.* Murut.

535. BUTEA SUPERBA Roxb.; F. I. iii. 247; F. B. I. ii. 195; E. D. B. 978.

Chota Nagpur; W. Bengal; Orissa.

A very heavy climber. *Beng.* Lata-palas; *Hind.* Chihunt; *Santal.* Nari murup.

248. **Spatholobus** Hassk.

Large woody twiners; *leaves* pinnately 3-foliolate; stipules small; stipels subulate. *Flowers* small, in large terminal panicles extending into the upper leaf-axils, densely fascicled on the swollen nodes of the individual racemes; bracts lanceolate; bracteoles linear, small. *Sepals* 5, connate in a campanulate calyx; teeth lanceolate or deltoid, the two upper connate in a lip. *Petals* exserted, subequal in length; standard ovate or orbicular obtuse, not appendaged at base; wings obliquely oblong, free; keel obtuse, straight. *Stamens* 10; vexillary filament free, the rest connate; anthers uniform. *Ovary* sessile or stipitate, 2-ovuled; style subulate, incurved, beardless; stigma terminal capitate. *Fruit* a firm oblong or wide-ligulate follicle, the base flat, wing-like and empty, the top thick and tardily splitting along the dorsal suture round the solitary seed. *Seed* compressed; hilum small; strophiole 0.

Leaflets very firm grey-canescent beneath, the end leaflet obovate, rhomboid, all obtuse or shortly cuspidate...........................*Roxburghii.*
Leaflets membranous or papery glabrous beneath, the end one ovate acute like the lateral pair ....*Listeri.*

536. SPATHOLOBUS ROXBURGHII Benth.; F. B. I. ii. 193; E. D. S. 2508. *Butea parviflora* F. I. iii. 248.

Behar; Chota Nagpur; W. Bengal; Tirhut; N. Bengal.
A very heavy woody climber. *Hind.* Maula; *Kol.* Moru; *Santal.* Chihunt lar.

537. Spatholobus Listeri Prain.
Chittagong.
A large climber.

249. **Clitoria** Linn.

Herbs or shrubs, twining or erect; *leaves* pinnately 3–7-foliolate; stipules persistent striate; stipels small subulate, sometimes 0. *Flowers* very showy, blue, white, red or purple, axillary solitary or paired, or in pairs on the rachis of axillary racemes; bracts stipule-like, persistent, paired, the lower opposite free, the upper connate in one; bracteoles usually large, striate, persistent. *Sepals* 5, connate in a membranous tube; the lowest tooth narrowest, the two upper subconnate in a lip. *Petals* much exserted; standard large erect emarginate narrowed to the base, without appendages; wings falcate-oblong, spreading, adnate in the middle to the keel; keel shorter than wings, incurved, acute. *Stamens* 10; vexillary filament free, or more or less connate with the others; anthers uniform. *Ovary* stipitate, many-ovuled; style long incurved somewhat dilated at the top, longitudinally bearded on the face. *Fruit* a linear compressed pod somewhat thickened along the upper or both sutures, occluded or continuous within. *Seeds* subglobose or compressed; strophiole 0.

538. Clitoria Ternatea Linn.; F. I. iii. 321; F. B. I. ii. 208; E. D. C. 1403.
In gardens everywhere; also often self-sown in village jungles, and by waysides.
A slender climber with large cobalt blue, or, less often, pure white flowers. *Vernac.* Aparajita.

250. **Sesbania** Pers.

Herbs, shrubs, or small, soft-wooded trees, sometimes prickly; *leaves* even-pinnate, leaflets many-jugate, entire; stipules usually caducous; stipels minute or 0. *Flowers* in lax axillary racemes with slender pedicels; bracts and bracteoles setaceous, caducous or persistent. *Sepals* 5, connate in a campanulate, slightly 2-lipped, or truncate or shortly equally 5-lobed tube. *Petals* much exserted; standard round or ovate, spreading or reflexed; wings falcate-

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oblong; keel incurved, obtuse, or bluntly acuminate, long-clawed. *Stamens* 10; vexillary filament free, jointed at the base with the sheath; anthers uniform or occasionally alternately slightly longer and shorter. *Ovary* usually stipitate, many-ovuled; style incurved, beardless; stigma terminal capitate. *Fruit* a linear or rarely oblong pod, flattened, subterete, 4-angled or 4-winged, sometimes subindehiscent, septate within between the numerous seeds. *Seeds* transversely oblong or quadrate; strophiole 0.

Flowers small to medium (·75 in. or less), buds straight:—
Pods twisted, pendulous; flowers ·5 in. or more long; stems and branches unarmed:—
Perennial, stems woody; flowers ·6 in.; pods 6 in. long, sutures undulate and valves widely depressed between the seeds; small trees:—
Flowers uniformly yellow ....*ægyptiaca.*
Flowers more or less coloured:—
Standard externally dotted with purple ...*ægyptiaca* var. *picta.*
Standard externally dark maroon or purple *ægyptiaca* var. *bicolor.*
Annual, stems pith-like; flowers ·75 in.; pods 10–12 in. long, sutures straight, valves slightly abruptly depressed between the seeds; a swamp species with tree-like stems ....*paludosa.*
Pods not twisted, erect or ascending (except sometimes in *S. cannabina*); flowers ·4 in. or less long; annuals with woody stems:—
Stems erect:—
Stems very tall and rachises of leaves smooth; pods with straight sutures and valves not depressed, oftenest spreading or pendulous, 4–8 in. long ....*cannabina.*
Stems short and rachises of leaves armed with weak prickles; pods with slightly undulate sutures and valves widely depressed between the seeds, 9–12 in. long ....*aculeata.*
Stems diffuse, procumbent, and rachises of leaves smooth; pods subtorulose, very erect, 3–4 in. long ....*uliginosa.*
Flowers large (3 in. long), buds falcately recurved; considerable trees with white or reddish flowers ....*grandiflora.*

539. SESBANIA ÆGYPTIACA Pers.; F. B. I. ii. 114 partly.
Cultivated occasionally.
A small tree.

539/2. Var. PICTA Prain. *S. ægyptiaca* F. B. I. ii. 114 partly.
Cultivated fairly commonly.
A small tree.

539/3. Var. BICOLOR W. & A. *S. picta* F. B. I. ii. 114. *Æschynomene Sesban* F. I. 332. E. D. S. 1174.
Generally cultivated and often subspontaneous.
A small tree. *Vernac.* Jainti.

540. SESBANIA PALUDOSA Prain. *S. aculeata* var. *paludosa* F. B. I. ii. 115 partly. *Æschynomene paludosa* F. I. iii. 333. E. D. S. 1164.
Central and Eastern Bengal, in jheels; common.
A tall marsh plant with tree-like stems. *Beng.* Kathsola.

541. SESBANIA CANNABINA Pers. *S. aculeata* var. *cannabina* F. B. I. ii. 115. *Æschynomene cannabina* F. I. iii. 335. E. D. S. 1166.
Cultivated in N. C. and E. Bengal.
An unarmed annual with very tall slender stems. *Beng.* Dhunchi.

542. SESBANIA ACULEATA Pers.; F. B. I. ii. 114. *Æschynomene spinulosa* F. I. iii. 333. E. D. S. 1163.
In all the provinces, in wet fields.
A low virgate prickly undershrub.

543. SESBANIA ULIGINOSA Sweet. *S. aculeata* var. *paludosa* F. B. I. ii. 115 partly. *Æschynomene uliginosa* F. I. iii. 334.
Central Bengal.
A diffuse, prostrate, unarmed annual weed of wet places.

544. SESBANIA GRANDIFLORA Pers.; F. B. I. ii. 115; E. D. S. 1186. *Æschynomene grandiflora* F. I. iii. 331.
Generally planted.
A soft-wooded tree. *Vernac.* Agati, agasthi.

251. Tephrosia Pers.

Herbs or undershrubs, rarely shrubs; *leaves* odd-pinnate; leaflets numerous, rarely 3 or 1, obliquely parallel-veined from the midrib, usually silky beneath; stipules setaceous, sometimes spinescent, or, if broader, striate; stipels 0. *Flowers* paired or fascicled in the axils of leaves or on terminal leaf-opposed or less often axillary racemes, occasionally both axillary and racemose; racemes with bracts consisting of connate stipules; bracteoles 0. *Sepals* 5 connate in a campanulate tube; teeth subequal or the 2 upper slightly connate or the lowest occasionally longer than the

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rest. *Petals* all clawed; standard rounded; wings obliquely obovate or oblong, slightly adnate to the incurved obtuse keel. *Stamens* 10; vexillary filament free below, at first connate in the middle with the others, but at length usually free; anthers uniform. *Ovary* sessile, usually several-, rarely 2-ovuled; style incurved or bent, hardened, often flattened, bearded or not; stigma terminal capitate, usually penicillate. *Fruit* a linear pod, somewhat compressed, continuous or obscurely septate within. *Seeds* ovate; strophiole sometimes small, usually 0.

Calyx-teeth deltoid, shorter than the tube; shrubs; pods densely clothed with adpressed brown hairs, slightly recurved; leaflets acute, 9–12 pairs *candida.*
Calyx-teeth narrow-cuspidate, as long as tube; herbs; leaflets obtuse:—
  Stems erect or suberect; leaflets 6–10 pairs:—
    Pods densely clothed with long, persistent, spreading silky hairs:—
      Pods much recurved, covered with white hairs ....*villosa.*
      Pods slightly recurved, covered with brown hairs ......*Hookeriana.*
    Pods finely downy with short hairs or glabrescent, slightly recurved *purpurea.*
  Stems prostrate, diffuse; leaflets 4–5 pairs; pods finely downy, slightly recurved ....*pumila.*

545. TEPHROSIA CANDIDA DC.; F. B. I. ii. 111. *Robinia candida* F. I. iii. 327.

N. Bengal; Chittagong: elsewhere often planted.

A low shrub, 6–8 feet high.

546. TEPHROSIA VILLOSA Pers.; F. B. I. ii. 113; E. D. T. 280. *Galega villosa* F. I. iii. 385.

Behar; W. Bengal.

A branching perennial herb, 2–3 feet high.

547. TEPHROSIA HOOKERIANA W. & A.; F. B. I. ii. 113.

C. Bengal; E. Bengal.

A branching perennial herb, 2–3 feet high.

548. TEPHROSIA PURPUREA Pers.; F. B. I. ii. 112; E. D. T. 270. *Galega purpurea* F. I. iii. 386. *G. lanceæfolia* F. I. iii. 386. *G. tinctoria* F. I. iii. 386, not of Linn.

In all the provinces, in waste places and by waysides.

A much-branched, very variable perennial herb; stems 1–2 feet high. *Vernac.* Sarphonka, ban-nil.

549. TEPHROSIA PUMILA Pers. *T. purpurea* var. *pumila* F. B. I. ii. 113. *Galega diffusa* F. I. iii. 387.
Behar; Chota Nagpur: in fields.
A diffuse perennial weed.

252. Millettia W. & A.

Large climbing shrubs or occasionally trees; *leaves* odd-pinnate, alternate; stipules usually small; leaflets opposite; stipels small, subulate, sometimes 0. *Flowers* fascicled, rarely scattered, on the rachis of axillary or terminal simple racemes or panicles; bracts small, caducous; bracteoles caducous. *Sepals* 5, connate in a campanulate tube; teeth usually short or nearly obsolete. *Petals* much exserted; standard obovate or orbicular, spreading or reflexed, with or without a callosity at the top of the claw, and auriculate or not at the base; wings obliquely oblong, not adnate to the keel, sometimes connate by their tips; keel incurved, obtuse. *Stamens* 10; vexillary filament sometimes quite free, sometimes connate in the middle with the rest; anthers uniform, versatile. *Ovary* sessile or rarely stipitate, base usually enclosed in an annular disk or sheath, many-ovuled; style inflexed, beardless, stigma terminal, capitate. *Fruit* a linear lanceolate or oblong, compressed or thickened, coriaceous or woody pod, usually very tardily dehiscent. *Seeds* orbicular or reniform; hilum small.

Standard not auricled at the base; stamens diadelphous; pods torulose:—
  Leaflets 13–15, obscurely silky beneath; stipellæ large; standard glabrous on the back; pod coriaceous, glabrous ....*racemosa.*
  Leaflets 5–7, glabrescent beneath; stipellæ small; standard silky on the back; pod thick, velvety ....*cinerea.*
Standard auricled at the base; stamens monadelphous; pods flattened:—
  Leaflets 7–9; flowers shortly pedicelled; pod silky............*auriculata.*
  Leaflets 9–11; flowers subsessile; pod glabrescent ....*fruticosa.*

550. MILLETTIA RACEMOSA Benth.; F. B. I. ii. 105. *M. leiogyna* F. B. I. ii. 109. *Robinia racemosa* F. I. iii. 329.
Behar, Rajmahal Hills; Orissa, Khurda.
A large woody climber.

551. MILLETTIA CINEREA Benth.; F. B. I. ii. 106.
Chittagong.
A large woody climber.

552. MILLETTIA AURICULATA Bak.; F. B. I. ii. 108. *M. extensa* F. B. I. ii. 109. *Robinia macrophylla* F. I. iii. 329.

Chota Nagpur, very common.

A very large, stout, woody climber. *Santal.* Hehel; *Kol.* Hél.

553. MILLETTIA FRUTICOSA, Benth.; F. B. I. ii. 109. *Robinia fruticosa* F. I. iii. 328.

N. Bengal, very common near base of hills.

A very large, stout, woody climber.

253. **Pongamia** Vent.

A tree; *leaves* odd-pinnate, alternate; stipules small; leaflets opposite; stipels 0. *Flowers* in fascicles of 2–4 on the rachis of axillary racemes; bracts small, caducous; bracteoles minute, caducous. *Sepals* 5, connate in a campanulate tube; teeth obsolete. *Petals* much exserted; standard obovate or orbicular, auriculate at the base; wings obliquely oblong, slightly adnate to the keel above the claw; keel obtuse. *Stamens* 10; vexillary filament connate in the middle with the rest; anthers uniform, versatile. *Ovary* subsessile, 2-ovuled; style filiform, incurved, beardless; stigma terminal, capitate. *Fruit* an obliquely oblong, indehiscent, compressed lomentum, not winged on either suture. *Seed* solitary, rather thick, reniform; hilum small.

554. PONGAMIA GLABRA Vent.; F. B. I. ii. 240; E. D. P. 1121. *Galedupa indica* F. I. iii. 239.

Sundribuns; C. and E. Bengal, on banks of tidal creeks and rivers, elsewhere commonly planted, especially in Chota Nagpur.

A tree. *Vernac.* Karanj.

254. **Derris** Lour.

Large climbing shrubs, rarely trees; *leaves* odd-pinnate, alternate; stipules small; leaflets opposite; stipels usually 0. *Flowers* usually fascicled on the rachis of axillary or terminal racemes or panicles; bracts small, caducous; bracteoles ovate or orbicular, small, often caducous. *Sepals* 5, connate in a campanulate tube; teeth short, or nearly obsolete. *Petals* much exserted; standard obovate or orbicular, not auriculate at the base; wings obliquely oblong, slightly adnate to the keel above the claw; keel incurved, obtuse. *Stamens* 10; vexillary filament free below, connate in the middle with the rest, rarely quite free; anthers uniform, versatile. *Ovary* sessile or shortly stipitate; ovules 2 or more; style filiform, incurved, beardless; stigma terminal, capitate. *Fruit* an obliquely orbicular or oblong indehiscent compressed lomentum, winged along the upper or both sutures. *Seeds* solitary or several, compressed, reniform or orbicular; hilum small.

Standard with no thickened callosities at the base:—
  Vexillary stamen quite free; flowers single in ample thyrsoid panicles, nodes neither swollen nor produced into stalks; pods winged along upper suture, sutures sinuate between the seeds ....*sinuata.*
  Vexillary stamen united with the others at least in the centre of the sheath; flowers fascicled on tumid nodes that are sometimes produced into stalks; pods not sinuate:—
    Pods winged only along the upper suture:—
      Pods narrow, pointed at both ends, several-seeded:—
        Leaflets equal at base; pods silky; a climber ....*scandens.*
        Leaflets oblique at base; pods glabrous; a tree............*robusta.*
      Pods suborbicular, obtuse, glabrous; seeds solitary ......*uliginosa.*
    Pods winged along both sutures, glabrous.....................*marginata.*
Standard with 2 thickened callosities at the base; vexillary stamen united with the others:—
  Leaves and petals glabrous; racemes much shorter than leaves *cuneifolia.*
  Leaves and petals pubescent; racemes nearly as long as leaves *elliptica.*

555. DERRIS SINUATA Thw.; F. B. I. ii. 246.
Sundribuns.
A large climber in tidal forests.

556. DERRIS SCANDENS Benth.; F. B. I. ii. 240; E. D. D. 330. *Dalbergia scandens* F. I. iii. 232.
In all the provinces.
A slender woody climber, with excentric stems. *Beng.* Noalatá.

557. DERRIS ROBUSTA Benth.; F. B. I. ii. 241; E. D. D. 328. *Dalbergia Krowee* F. I. iii. 229.
Chittagong.
A tree 40–50 feet high. *Beng.* Korai.

558. DERRIS ULIGINOSA Benth.; F. B. I. ii. 241. *Galedupa uliginosa* F. I. iii. 243.
Sundribuns; Chittagong, coast; C. Bengal, banks of tidal rivers.
An extensive littoral climber. *Beng.* Pan-latá.

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559. DERRIS MARGINATA Benth.; F. B. I. ii. 245. *Dalbergia marginata* F. I. iii. 230.
Chittagong.
A large showy climber. *Vernac.* Makrigila.

560. DERRIS CUNEIFOLIA Benth.; F. B. I. ii. 243. *Galedupa marginata* F. I. iii. 241.
E. Bengal; Chittagong.
A large woody climber.

561. DERRIS ELLIPTICA Benth.; F. B. I. ii. 243; E. D. D. 326. *Galedupa elliptica* F. I. iii. 242.
Chittagong.
An extensive, showy climber.

255. **Dalbergia** Linn. f.

Trees or shrubs, often climbing; *leaves* odd-pinnate, alternate; leaflets alternate, 5 or more, rarely 3 or 1; stipules usually small, deciduous; stipels 0. *Flowers* small, usually numerous, in simple or panicled axillary or terminal cymes; bracts small, subpersistent; bracteoles 2, usually minute, often deciduous. *Sepals* 5, connate in a campanulate tube; the two upper teeth widest, the lowest tooth longest. *Petals* somewhat exserted; standard ovate or orbicular; wings oblong; keel obtuse. *Stamens* 10 the vexillary filament free, the rest connate in a sheath, or 10 all connate in a sheath split above, or 10 in two lateral bundles of 5 each, or 9, less often 8, all connate in a sheath split above. *Ovary* stipitate, few-ovuled; style incurved, short, beardless; stigma terminal, capitate. *Fruit* a samaroid, indehiscent, compressed, or rarely thickened lomentum, neither thickened nor winged along the sutures, usually reticulate opposite the seed. *Seeds* 1–4, reniform, compressed; hilum small.

*Pod thin and flattened except opposite the seeds :—[p. 410]
  †Stamens in two lateral phalanges of 5 filaments each :—[p. 410]
    Bracts and bracteoles oblong, persistent, conspicuous; pod thickly suberous opposite the solitary seed, abruptly narrowed to a stipe twice as long as calyx; leaflets considerably longer than broad; a climber or a sarmentose shrub ....*stipulacea.*
    Bracts and bracteoles none, or inconspicuous deciduous; pod coriaceous opposite the seeds, gradually narrowed to a stipe; leaflets not much longer than broad :—

Pod narrow, 4–6 times as long as broad, not veined opposite the seeds; leaflets persistently hirsute on both sides; flowers in short congested axillary panicles; a tree; bracteoles 0; stalk of pod twice as long as calyx..*sericea*

Pod wider, only 2–3 times as long as broad, veined opposite the seeds; leaflets early glabrous on both sides; stalk of pod much longer than calyx:—

Calyx-teeth minute, deltoid; flowers in dense axillary and terminal panicles; a climber; bracteoles 0...............*volubilis.*

Calyx-teeth as long as tube; obtuse; a tree; bracteoles present; standard with a basal callosity ....*lanceolaria.*

†Stamens 9–10 in one bundle, vexillary stamen united to one edge of sheath or absent:—[p. 409]

Leaflets many (25–41), thinly pubescent, trapezoid-oblong, close-set, small; flowers in congested sessile axillary panicles; pod thin, papery; a climber ....*tamarindifolia.*

Leaflets fewer (never more than 15), glabrous, oblong or orbicular, distant, large or medium:—

Leaflets 11–15; flowers in ample terminal panicles, with subcapitate, congested corymbs at the ends of their branches; stalk of pod many times longer than calyx; a climber ....*confertiflora.*

Leaflets 3–7; flowers in axillary panicles; stalk of pod only twice as long as calyx; tall trees:—

Panicles small, pedicels short; leaflets roundish, distinctly cuspidate; pods narrow, 6–8 times as long as broad ......*Sissoo.*

Panicles lax, pedicels long; leaflets oblong or orbicular, obtuse or retuse; pods only 2–3 times as long as broad ....*latifolia.*

*Pod uniformly thickened throughout; upper suture falcate:—[p. 409]

Stamens in 2 lateral phalanges of 4 or 5 each; branches spinescent; an erect shrub ....*spinosa.*

Stamens 10 in one bundle; unarmed; a large climber...*candenatensis.*

562. DALBERGIA STIPULACEA Roxb.; F. I. iii. 233; F. B. I. ii. 237; E. D. D. 87.

N. Bengal; Chittagong.

A climber or erect shrub, according to circumstances.

563. DALBERGIA SERICEA G. Don. *D. hircina* F. B. I. ii. 236; E. D. D. 31. *D. stenocarpa* F. B. I. ii. 238.

N. Bengal.

A tree.

564. DALBERGIA VOLUBILIS Roxb.; F. I. iii. 231; F. B. I. ii. 235; E. D. D. 94.

Chota Nagpur; Behar; W. Bengal; N. Bengal; Orissa; Chittagong.

A large climbing shrub. *Santal.* Bir munga, nari siris; *Uriya* Nubari.

565. DALBERGIA LANCEOLARIA Linn. f.; F. B. I. ii. 235; E. D. D. 32. *D. frondosa* F. I. iii. 226. *D. zeylanica* F. I. iii. 228.

Behar; Chota Nagpur; W. Bengal: planted elsewhere.

A tall, handsome tree. *Santal.* Chapot siris.

566. DALBERGIA TAMARINDIFOLIA Roxb.; F. I. iii. 233; F. B. I. ii. 234; E. D. D. 92.

Chittagong.

A climbing or, rarely, suberect shrub.

567. DALBERGIA CONFERTIFLORA Benth.; F. B. I. ii. 233.

Chittagong.

A large climber.

568. DALBERGIA SISSOO Roxb.; F. I. iii. 223; F. B. I. ii. 231; E. D. D. 64.

In all the provinces.

A tall tree. *Vernac.* Sissoo.

569. DALBERGIA LATIFOLIA Roxb.; F. I. iii. 221; F. B. I. ii. 231; E. D. D. 40.

Chota Nagpur; Behar; N. Bengal.

A tall tree. *Beng.* Sitsal.

570. DALBERGIA SPINOSA Roxb.; F. I. iii. 233; F. B. I. ii. 238; E. D. D. 84.

Sundribuns.

An erect, spiny shrub.

571. DALBERGIA CANDENATENSIS Prain. *D. monosperma* F. B. I. ii. 237; E. D. D. 48.

Sundribuns.

A rather extensive climber.

256. **Pterocarpus** Linn.

Erect timber trees; *leaves* odd-pinnate, alternate; leaflets firmly papery or coriaceous, alternate; stipules small, deciduous; stipels 0. *Flowers* yellow, in terminal or axillary racemes or panicles; pedicels faintly or distinctly articulate; bracts small, deciduous; bracteoles 2, often caducous. *Sepals* 5, connate in a turbinate or campanulate tube, somewhat incurved; teeth short, the two upper sometimes subconnate. *Petals* exserted; standard

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orbicular or wide-ovate, not appendiculate, its margins crisped as are those of the obliquely oblong wings; keel-petals similar but smaller, not adnate to wings, and not or only slightly connate. *Stamens* 10, all connate in a sheath split above, or in two lateral sheaths of 5 each, or the vexillary filament free, with the rest connate in one sheath or in 2, rarely 3, bundles; anthers uniform, versatile. *Ovary* sessile or stipitate, 2–6-ovuled; style filiform, incurved, beardless; stigma terminal, capitate. *Fruit* a compressed, indehiscent, orbicular or ovate lomentum, with the style then usually lateral, the centre seed-bearing and often externally reticulate, the margin forming a coriaceous or submembranous wing; septate within if more than 1-seeded. *Seeds* 1–2, oblong or subreniform; hilum small.

Leaves firmly coriaceous, finely pubescent beneath; pod velvety when young; pedicels short:—
  Leaflets oblong, obtuse...*Marsupium*.
  Leaflets ovate, acute or acuminate.................................*Marsupium* var. β.
Leaves firmly papery or thinly coriaceous, glabrous; pods very sparsely pubescent when young; pedicels long, slender:—
  Leaves ovate-rotund, with a sudden blunt point, main nerves beneath hardly more distinct than the secondary; panicles almost all axillary, only one raceme terminal; bracteoles lanceolate ....*indicus*.
  Leaves ovate-lanceolate, narrowed gradually to the apex, 5–7 pairs of main nerves much stronger beneath than secondary; panicles large, terminal, or only extending into the axils of 2–3 distal leaves; bracteoles ovate ....*dalbergioides*.

572. PTEROCARPUS MARSUPIUM Roxb.; F. I. iii. 234; F. B. I. ii. 239; E. D. P. 1370.
Orissa, Khurda; Chota Nagpur.
A tall tree. *Vernac.* Bija sal; pit sal. The Gum Kino tree.

572/2. Var. β. *P. indicus* F. B. I. ii. 238 partly, not of Willd.
Behar, Rajmahal Hills.
A medium tree. *Vernac.* Bija sal. Gum Kino tree.

573. PETROCARPUS INDICUS Willd.; F. I. iii. 238; F. B. I. ii. 238 partly.
Planted occasionally in C. Bengal.
A medium tree; native of Moluccas.

574. PETROCARPUS DALBERGIOIDES Roxb.; F. I. iii. 236. *P. indicus* F. B. I. ii. 238 partly; E. D. P. 1363.
Planted not infrequently in C. Bengal.
A tall tree. Andaman Red Wood.

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257. **Melilotus** Linn.

Annual or biennial herbs; *leaves* pinnately 3-foliolate; main-nerves of the leaflets excurrent as marginal teeth; stipules adnate; stipels 0. *Flowers* small, white or yellow, in slender axillary racemes; bracts minute or 0; bracteoles 0. *Sepals* 5, connate in a campanulate tube; teeth subequal, lanceolate. *Petals* deciduous, free from the staminal tube; standard obovate or oblong, subsessile; wings oblong, longer than the obtuse keel. *Stamens* 10; vexillary filament free or connate in the middle with the others; filaments filiform; anthers uniform. *Ovary* sessile or stipitate, few-ovuled; style filiform, incurved; stigma small, terminal. *Fruit* a subglobose or oblong thick-walled tardily dehiscent pod or indehiscent lomentum, longer than the calyx. *Seeds* few or solitary; strophiole 0.

Corolla minute, yellow; pod usually 1-seeded; annual..............*indica.*
Corolla rather larger, white; pod often 2-seeded; biennial............*alba.*

575. Melilotus indica All. *M. parviflora* F. B. I. ii. 89; E. D. M. 422. *Trifolium indicum* F. I. iii. 388.

In all the provinces.

A small field-weed of the cold season. *Vernac.* Ban-methi.

576. Melilotus alba Lamk; F. B. I. ii. 89.

In all the provinces.

A field-weed appearing in the cold-season. *Vernac.* Safed ban-methi.

258. **Trigonella** Linn.

Annual herbs; *leaves* pinnately 3-foliolate; main-nerves of the leaflets usually excurrent as marginal teeth; stipules adnate; stipels 0. *Flowers* solitary axillary, or capitate, subumbellate or densely racemed on very short or elongated axillary peduncles; bracts minute or obsolete; bracteoles 0. *Sepals* 5, connate in a tubular calyx; teeth distinct, subequal. *Petals* free from the staminal tube; standard obovate or oblong, short-clawed or sessile; wings oblong, longer than the obtuse keel. *Stamens* 10; vexillary filament free or connate in the middle with the others; filaments filiform; anthers uniform. *Ovary* sessile or shortly stipitate, many-ovuled; style filiform or thickened, beardless; stigma terminal, small. *Fruit* usually an indehiscent lomentum, less often a follicle opening by the ventral suture, rarely a pod; thick and long-beaked or thinner, linear or compressed or terete, straight or falcate, continuous within. *Seeds* rather numerous; strophiole 0.

Erect, robust; flowers 1–2, axillary; pod long, turgid, beaked *Fœnum-græcum.*

Diffuse, slender; flowers 6–12, closely racemose; pod flat, linear, falcately recurved .... *corniculata.*

577. TRIGONELLA FŒNUM-GRÆCUM Linn.; F. I. iii. 389; F. B. I. ii. 87; E. D. T. 612.

Cultivated in the western provinces.

An annual crop. *Vernac.* Methi. A Fennel.

578. TRIGONELLA CORNICULATA Linn.; F. I. iii. 389; F. B. I. ii. 88.

Tirhut and N. Bengal, cultivated; in C. Bengal only a cold-weather weed and rare. *Beng.* Piring.

259. **Medicago** Linn.

Herbs, rarely shrubs; *leaves* pinnately 3-foliolate; main-nerves of leaflets often excurrent as marginal teeth; stipules adnate; stipels 0. *Flowers* small, in axillary racemes or heads, rarely subsolitary; bracts small or 0; bracteoles 0. *Sepals* 5, connate in a campanulate tube; teeth subequal. *Petals* exserted, free from the calyx-tube; standard obovate or oblong, subsessile; wings oblong, longer than the obtuse keel. *Stamens* 10; vexillary filament free, the rest connate; filaments filiform; anthers uniform. *Ovary* sessile or shortly stipitate, usually many-ovuled, rarely 1-ovuled; style subulate, beardless; stigma subcapitate, oblique. *Fruit* a spirally twisted, rarely falcate, indehiscent lomentum. *Seeds* several, rarely (*M. lupulina*) solitary; strophiole 0.

Stems suberect; a crop.. *sativa.*

Stems diffuse, trailing; field-weeds:—

Pods minute, sickle-shaped, unarmed, 1-seeded .... *lupulina.*

Pods subglobose, spiral, muricated .... *denticulata.*

579. MEDICAGO SATIVA Linn.; F. B. I. ii. 90; E. D. M. 334.

A cold-weather forage crop, especially in Behar.

A suberect, much-branched herb, 1–2 feet high. Lucern.

580. Medicago lupulina Linn.; F. B. I. ii. 90; E. D. m. 332.
N. Bengal.
A diffuse, finely downy, trailing weed.

581. Medicago denticulata Willd.; F. B. I. ii. 90; E. D. m. 329. *M. polymorpha* F. I. iii. 390.
Behar; N. Bengal.
A diffuse, almost glabrous weed. *Vernac.* Mainá.

260. **Arachis** Linn.

Prostrate herbs; *leaves* even-pinnate, leaflets 2-jugate; stipules adnate; stipels 0. *Flowers* in a dense, axillary spike, sessile or shortly pedicelled in the axil of a leaf or a 2-auriculate bract; bracteoles below the calyx linear. *Sepals* 5, connate in a long, slender tube; lobes membranous, the lowest slender, distinct, the 4 upper connate in a lip. *Petals* inserted with the stamens at the apex of the tube; standard suborbicular; wings oblong, free; keel incurved, beaked. *Stamens* 10, or less often 9, connate in a closed tube; anthers alternately longer subbasifixed, and shorter versatile. *Ovary* sessile at the base of the calyx-tube, 2–3-ovuled; after flowering raised by and continuous with the much-elongated, stipe-like, reflexed, and rigid receptacle, with a small apical callosity left by the disappearance of the style; style long, filiform; stigma terminal, minute. *Fruit* a thick, oblong, reticulate, indehiscent lomentum, subtorulose but continuous within, burying itself to ripen underground. *Seeds* 1–3, irregularly ovoid; cotyledons thick, fleshy.

582. Arachis hypogæa Linn.; F. B. I. ii. 161; E. D. A. 1261.
Occasionally cultivated.
An annual herb, ripening its pods underground. *Beng.* Belati-mung, chiné-badam, mat-kalai. The Ground Nut.

261. **Zornia** Gmel.

Annual herbs; *leaves* digitately 4-foliolate or 2-foliolate; leaflets gland-dotted; stipules subfoliaceous, gland-dotted; stipels 0. *Flowers* in interrupted spikes or solitary, on terminal or axillary peduncles; bracts geminate, stipular, striate, larger than the true stipules; bracteoles 0. *Sepals* 5, connate in a small subhyaline calyx; 2 upper lobes connate in a lip, lowest lobe oblong or lanceolate, as long as the upper, 2 lateral lobes small. *Petals* exserted; standard suborbicular, clawed; wings obliquely oblong;

keel incurved, acute. *Stamens* 10, connate in a closed tube; anthers alternately longer subbasifixed, and shorter sessile. *Ovary* sessile, many-ovuled; style filiform; stigma terminal, capitate. *Fruit* a lomentum of several small, rounded, finely muricate, 1-seeded indehiscent joints. *Seeds* subreniform; strophiole 0.

583. Zornia diphylla Pers.; F. B. I. ii. 147; E. D. Z. 300. *Hedysarum diphyllum* F. I. iii. 353.

Behar; Chota Nagpur; W. Bengal. *Santal.* Tandi japni.

262. **Alhagi** Desv.

Spiny shrubs; *leaves* simple, small, entire; stipules small. *Flowers* few, in axillary racemes with spine-tipped rachis; bracts minute; bracteoles 0. *Sepals* 5, connate in a campanulate tube; teeth short, subequal. *Petals* exserted; standard obovate, shortly clawed; wings subfalcate, free; keel incurved, obtuse. *Stamens* 10; vexillary filament free, the rest connate; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, incurved, beardless; stigma terminal, capitate. *Fruit* a linear, thickish, indehiscent lomentum, constricted and doubly septate between the seeds, but not jointed. *Seeds* reniform; strophiole 0.

584. Alhagi camelorum Fisch. *A. maurorum* F. B. I. ii. 145; E. D. A. 745. *Hedysarum Alhagi* F. I. iii. 344.

Behar, Gyra.

A low, pungently spiny shrub. *Hind.* Javásá.

263. **Lespedeza** Michx.

Herbs or shrubs, usually softly silky; *leaves* pinnately 3-foliolate, rarely 1-foliolate, leaflets entire; stipules free, small; stipels 0. *Flowers* numerous, in axillary fascicles or racemes or in terminal panicles; bracts small; bracteoles 2 at apex of pedicels. *Sepals* 5, connate in a campanulate tube; lobes subequal or the 2 upper slightly connate. *Petals* exserted; standard obovate or oblong, narrowed to a claw; wings falcate, free or faintly adnate to the incurved, obtuse or beaked keel. *Stamens* 10; vexillary filament free, the others connate in a sheath; anthers uniform. *Ovary* sessile or stipitate, 1-ovuled; style filiform, incurved; stigma terminal, capitate. *Fruit* an ovate or orbicular, reticulate, flattened, indehiscent, 1-seeded lomentum. *Seed* compressed, suborbicular; strophiole 0.

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585. LESPEDEZA SERICEA Miq.; F. B. I. ii. 142.

Chota Nagpur, on higher hills, rare: not reported from Parasnath.

An erect undershrub with long, slender, virgate branches.

264. Smithia Ait.

Herbs or undershrubs; *leaves* even-pinnate, the rachis ending in a bristle, rarely with a terminal leaflet; leaflets small, sensitive; stipules persistent, membranous or scarious; stipels 0. *Flowers* in axillary, usually unilateral, racemes; bracts and bracteoles scarious or membranous, persistent. *Sepals* 5, connate in a deeply 2-lipped calyx; upper lip entire or emarginate, lower entire or shortly 3-lobed. *Petals* exserted; standard suborbicular, short-clawed; wings oblique, oblong, rarely obovate; keel incurved, obtuse. *Stamens* connate in 2 lateral bundles of 5 each, the bundles at first slightly adnate in front; anthers uniform. *Ovary* sessile or stipitate, many-ovuled; style filiform, incurved; stigma terminal, capitate. *Fruit* a lomentum of few or numerous, flattened or turgid 1-seeded joints, folded together inside the calyx. *Seeds* reniform; strophiole 0.

Calyx rigid, with close, parallel, simple veins:—
  Flowers in short, simple racemes; leaves and calyx slightly bristly *sensitiva*.
  Flowers in pairs in the axils of the leaves; leaves and calyx distinctly bristly; upper nodes of stem congested in a head *geminiflora* var. *conferta*.
Calyx membranous, with distinctly separated anastomosing veins:—
  Racemes dense axillary; bracteoles nearly as long as calyx, ciliated at the edges; calyx densely bristly; stems slender, 1–2 feet high...*ciliata*.
  Racemes forming a lax corymbose panicle; bracteoles less than half as long as calyx, obtuse; calyx with only a few bristles; stems stout, 3–4 feet high..*grandis*.

586. SMITHIA SENSITIVA Ait.; F. I. iii. 342; F. B. I. ii. 148; E. D. S. 2259.

In all the provinces.

An annual weed of waste places. *Hind.* Oda-brini; *Beng.* Nala-kashina.

587. SMITHIA GEMINIFLORA Roth var. CONFERTA Bak.; F. B. I. ii. 149.

Behar; Chota Nagpur.

A weed of waste places.

588. SMITHIA CILIATA Royle; F. B. I. ii. 150.
Chota Nagpur, Parasnath.
An annual herb in grassy places.

589. SMITHIA GRANDIS Benth.; F. B. I. ii. 151.
N. Bengal, Duars.
A tall herb in grassy places.

265. Æschynomene Linn.

Erect undershrubs or shrubs; *leaves* odd-pinnate; leaflets numerous, sensitive, linear, close-set; stipules setaceous or lanceolate; stipels 0. *Flowers* in axillary, rarely terminal, simple, or sometimes branched racemes; bracts usually stipule-like; bracteoles adpressed to calyx. *Sepals* 5, connate in a deeply 2-lipped calyx; upper lip entire, lower entire or shortly 3-lobed. *Petals* deciduous; standard orbicular, short-clawed; wings obliquely obovate or oblong; keel obovate, nearly straight, or narrow and incurved. *Stamens* 10, connate in two lateral bundles of 5 each; anthers uniform. *Ovary* stipitate, 2–many-ovuled; style incurved, beardless; stigma terminal, capitate. *Fruit* a linear, long-stipitate lomentum, with 2–8 flattened, 1-seeded, separating joints. *Seeds* subreniform, compressed; strophiole 0.

Stems slender, much branched; peduncles viscid; calyx and small corolla glabrous; pods smooth or papillose .... *indica*.
Stems stout, slightly branched, or simple; peduncles not viscid; calyx and larger corolla hispid; pods echinulate .... *aspera*.

590. ÆSCHYNOMENE INDICA Linn.; F. B. I. ii. 151; E. D. A. 565. *Hedysarum Neli-Tali* F. I. iii. 365.
In ditches and jheels, general.
An annual undershrub with many slender branches. *Beng.* Bhath-sola.

591. ÆSCHYNOMENE ASPERA Linn.; F. B. I. ii. 152; E. D. A. 560. *Smithia aspera* F. I. iii. 343. *Hedysarum lagenarium* F. I. iii. 365.
In ditches and jheels, general.
A tall, erect shrub with few branches. *Beng.* Sola.

266. Eleiotis DC.

An annual herb; *leaves* 1-foliolate, but with occasionally a pair of minute lateral leaflets added; stipules short, striate; stipels under the reniform leaflet subulate. *Flowers* usually in pairs on terminal or axillary racemes; bracts large, striate, deciduous; bracteoles minute or 0. *Sepals* 5, connate in a very short tube with subequal, setaceous teeth. *Petals* minute; standard orbicular, emarginate, narrowed to a claw; wings oblong, adnate to the obtuse keel. *Stamens* 10; vexillary filament free, the rest connate; anthers uniform. *Ovary* subsessile, 1-ovuled; style short, inflexed above, thickened below; stigma terminal, capitate. *Fruit* a compressed, dimidiate, indehiscent, 1-seeded, membranous, reticulate lomentum; dorsal margin straight. *Seed* transversely oblong, subreniform; strophiole 0.

592. ELEIOTIS SORORIA DC.; F. B. I. ii. 153. *Hedysarum sororium* F. I. iii. 352.

W. Behar, rare.

A slender, trailing annual.

267. Uraria Desv.

Perennial herbs or undershrubs; *leaves* odd-pinnate, leaflets 1–9; stipules free, acuminate, striate below; stipels subulate. *Flowers* many, in terminal spicate racemes; bracts ovate or lanceolate, acuminate, persistent or deciduous; bracteoles 0. *Sepals* 5, connate in a very short tube; 2 upper teeth short, 3 lower setaceous. *Petals* small; standard orbicular or obovate, narrowed to a claw; wings falcate-oblong, adnate to the slightly incurved, obtuse keel. *Stamens* 10; vexillary filament free, the rest connate; anthers uniform. *Ovary* sessile or shortly stipitate, 2–many-ovuled; style filiform, inflexed; stigma terminal, capitate. *Fruit* a lomentum of 2–6 small, turgid, 1-seeded, indehiscent joints, usually more or less folded together within the calyx, occasionally falcately continuous and exserted. *Seeds* orbicular or subglobose; strophiole 0.

Upper leaves 5–9 foliolate:—

Leaflets clouded, linear; pedicels shortly bristly; joints of pod whitish, shining ....*picta.*

Leaflets green, oblong; pedicels clothed with long bristles; joints of pod opaque ....*crinita.*

Leaves 3–1-foliolate intermixed:—

*Stems trailing; leaflets small, orbicular or oblong; heads short, dense, oblong; bracts narrow, ciliated, persistent; lower calyx-teeth elongated; joints of pod finely pubescent [p. 420] ....*lagopoides.*

*Stems erect ; leaflets large :—[p. 419]

Leaflets cordate-ovate, often clouded ; heads short, dense, cylindric ; bracts ovate, ciliated, persistent ; lower calyx-teeth elongated ; joints of pod glabrous .... *alopecuroides.*

Leaflets ovate or oblong, not cordate, green ; heads long, cylindric ; bracts cuspidate, pubescent, deciduous ; calyx-teeth subequal :—

Joints of pod opaque, dark, pubescent ; heads lax-flowered *hamosa.*

Joints of pod shining, pale, quite glabrous ; heads dense-flowered .... *neglecta.*

593. Uraria picta Desv. ; F. B. I. ii. 155 ; E. D. U. 25. *Doodia picta* F. I. iii. 368.
In all the provinces.
An erect, little-branched herb. *Beng.* Sankar-jata ; *Hind.* Dábrá.

594. Uraria crinita Desv. ; F. B. I. ii. 155. *Doodia crinita* F. I. iii. 369.
Chittagong.
An erect, little-branched herb.

595. Uraria lagopoides DC. ; F. B. I. ii. 156 ; E. D. U. 23. *Doodia lagopodioides* F. I. iii. 366.
In all the provinces.
A prostrate weed of grassy places. *Beng.* Golak chakulia ; *Hind.* Petwan.

596. Uraria alopecuroides Wight. *U. reparda* F. B. I. ii. 156. *Doodia alopecuroides* F. I. iii. 368.
Behar ; Chota Nagpur ; E. Bengal.
An erect herb or undershrub.

597. Uraria hamosa Wall. ; F. B. I. ii. 156. *Doodia hamosa* F. I. iii. 367. *D. simplicifolia* F. I. iii. 366.
Chota Nagpur ; Chittagong.
An erect, branching undershrub.

598. Uraria neglecta Prain. *U. lagopus* F. B. I. ii. 156 partly, not of DC.
N. Bengal, Duars.
A short, erect herb.

268. **Lourea** Neck.

Herbs, erect or prostrate ; *leaves* 1–3-foliolate, leaflets usually broader than long ; stipules free, striate or subulate ; stipels subulate. *Flowers* usually in pairs, in lax terminal racemes; bracts acuminate, caducous; bracteoles 0. *Sepals* 5, connate in a campanulate tube; teeth subequal, rather broad, accrescent. *Petals* short; standard obovate or obcordate, claw narrow; wings obliquely oblong, adnate to the slightly curved, obtuse keel. *Stamens* 10; vexillary filament free, the others connate; anthers uniform. *Ovary* 2- or more-ovuled, sessile or stipitate; style subulate, inflexed; stigma wide-capitate, terminal. *Fruit* a lomentum of 2 or more 1-seeded, indehiscent, ovate, compressed, subturgid joints folded together within the calyx. *Seeds* orbicular or subglobose; strophiole 0.

599. Lourea Vespertilionis Desv.; F. B. I. ii. 154. *Hedysarum Vespertilionis* F. I. iii. 352.

Sometimes planted; often as an escape in waste places.

An erect, little-branched herb. *Beng.* Chamchika.

269. Ougeinia Benth.

A tree; *leaves* pinnately 3-foliolate; stipules free, deciduous; stipels rather large. *Flowers* in densely fascicled racemes in leaf-axils and on old wood; pedicels fascicled on the rachis; bracts small, scale-like; bracteoles under the calyx minute, persistent. *Sepals* 5, connate in an obtusely campanulate tube; teeth all obtuse, the lowest larger than lateral, the 2 upper connate in an emarginate lip. *Petals* much exserted; standard suborbicular, short-clawed; wings obliquely oblong, slightly adnate to the obtuse, somewhat incurved keel. *Stamens* 10; vexillary filament free, the rest connate; anthers uniform. *Ovary* sessile, many-ovuled; style incurved, subulate; stigma terminal, capitate. *Fruit* an elongated, linear, flat, smooth pod of 2 or more oblong, reticulate, hardly dehiscent joints. *Seeds* compressed, reniform; strophiole 0.

600. Ougeinia dalbergioides Benth.; F. B. I. ii. 161; E. D. O. 537. *Dalbergia ougeinensis* F. I. iii. 220.

Behar; Chota Nagpur; Orissa.

An erect tree. *Hind.* Sandan; *Beng.* Tinis; *Uriya* Bandhona; *Kol.* Ruta.

270. Desmodium Desv.

Herbs or shrubs, rarely small trees; *leaves* 1-foliolate or pinnately 3-foliolate; stipules dry, usually striate, free or connate opposite the petiole; stipels subulate, often long. *Flowers* usually small, in simple or panicled terminal, rarely subaxillary racemes, paired or solitary on the rachis, less often in short-peduncled axillary umbels or fascicles; bracts single with solitary pedicels, in threes (an outer and two inner) with paired pedicels, striate or subulate and persistent, or membranous and deciduous; bracteoles large and persistent, or minute or obsolete. *Sepals* 5, connate in a campanulate or turbinate tube; teeth shorter or longer than tube, the 2 upper subconnate in a lip, the 3 lower acute, acuminate or subulate. *Petals* exserted; standard obovate, oblong or orbicular, short-clawed, base narrowed, rarely cordate; wings obliquely oblong, more or less adnate to the obtuse keel. *Stamens* 10, connate in a closed tube, or the vexillary filament partially or quite free, the rest connate; anthers uniform. *Ovary* sessile or stipitate, 2–many-ovuled; style incurved; stigma terminal, capitate. *Fruit* exserted from calyx, sessile or stipitate, usually distinctly jointed, the joints separating, 1-seeded, and indehiscent, less often hardly separating and dehiscing by one suture, rarely indistinctly jointed and follicular. *Seeds* compressed, orbicular or reniform; strophiole 0.

*Pods distinctly divided into several separating, 1-seeded joints:—[p. 424]
  †Leaves 3-foliolate:—[p. 423]
    Stems diffuse, prostrate:—
      Leaflets small, never over 1 in. long, rarely half that length; stems very slender, cylindric, trailing:—
        Pedicels hardly exceeding the petioles; leaflets obovate-cuneate, truncate or emarginate at apex; flowers all axillary, 1–3 together; pod with straight upper and indented lower suture *triflorum.*
        Pedicels longer than the petioles; leaflets oblong or obovate, rounded at apex:—
          Flowers 1–3 axillary, also 2–6 in small lax racemes; pods with straight upper and indented lower suture ......*heterophyllum.*
          Flowers none axillary, 6–10 in small lax racemes; pod indented on both sutures; leaflets smaller ......*parvifolium.*
      Leaflets large, 2–3 in. long; stems stout, angular; racemes many-flowered, lateral, axillary, also in terminal panicles; leaflets obovate, entire; pod indented on both sutures...............*diffusum.*
    Stems erect or suberect:—
      ‡Bracts large, 2-foliolate, persistent; a woody shrub [p. 423] *pulchellum.*

‡Bracts small, simple, deciduous:—[p. 422]
Flowers in dense, short-peduncled, axillary umbels; woody shrubs:—
Branches terete; joints of pod large, longer than broad *umbellatum.*
Branches angular; joints of pod small, as broad as long:—
Pods silky..*Cephalotes.*
Pods glabrescent........................*Cephalotes* var. *congesta.*
Flowers in more or less elongated racemes:—
Joints of pod not longer than broad, each dehiscing along the lower suture:—
Stems clothed with adpressed hairs ....*polycarpum.*
Stems clothed with spreading hairs *polycarpum* var. *trichocaulon.*
Joints of pod 4 times as long as broad, each joint indehiscent *laxiflorum.*

†Leaves 1-foliolate:—[p. 422]
Stems erect or suberect:—
Petioles not winged:—
Leaflets membranous or subcoriaceous, longer than broad, oblong, acute, glabrescent on the upper surface:—
Racemes lax; pods glabrescent; leaflets entire:—
Taller; leaves rounded or cuneate at base ......*gangeticum.*
Dwarf; leaves cordate at base, smaller *gangeticum* var. *maculata.*
Racemes dense; pods densely pubescent; leaflets obscurely repand...*virgatum.*
Leaflets coriaceous, as broad as long, ovate, subobtuse, repand, densely persistently scabrous; racemes dense; pods densely pubescent ....*latifolium.*
Petioles broadly winged:—
Pods hairy throughout, narrow ....*triquetrum.*
Pods glabrous throughout, very wide, thinly membranous *alatum.*
Stems diffuse:—
Petioles broadly winged; pods with a line of adpressed hairs along each suture, elsewhere glabrous ....*pseudo-triquetrum.*
Petioles not winged:—
Leaves reniform; calyx glabrous, teeth short; pedicels straight; pods 3–5-jointed, joints longer than broad; racemes lax *reniforme.*
Leaves rounded, cordate; calyx densely hairy, teeth long; pedicels decurved at tip; pods 2-jointed, joints as broad as long; racemes dense ....*brachystachyum.*

*Pods indistinctly jointed, dehiscing in a continuous line along the ventral suture; leaves 3-foliolate :—[p. 422]
Pod glabrescent or only downy; undershrubs 3–4 feet high :—
End-leaflet 4–6 times as long as broad ....*gyrans.*
End-leaflet twice as long as broad; flowers larger
gyrans var. *Roylei.*
Pod copiously, loosely pubescent; shrubs 8–10 feet high ......*gyroides.*

601. DESMODIUM TRIFLORUM DC.; F. B. I. ii. 173. *D. parvifolium* E. D. D. 343. *Hedysarum triflorum* F. I. iii. 353.
In all the provinces.
A common prostrate weed. *Santal.* Tandi chatom arak'.

602. DESMODIUM HETEROPHYLLUM DC.; F. B. I. ii. 173. *Hedysarum reptans* F. I. iii. 354.
E. Bengal, rare.
A prostrate weed.

603. DESMODIUM PARVIFOLIUM DC.; F. B. I. ii. 174.
Chota Nagpur, western parts, very rare.
A prostrate weed.

604. DESMODIUM DIFFUSUM DC.; F. B. I. ii. 169; E. D. D. 335. *Hedysarum articulatum* F. I. iii. 355. *H. quinqueangulatum* F. I. iii. 355.
Chota Nagpur; Behar; W. Bengal; C. Bengal.
A prostrate, diffuse, cæspitose herb.

605. DESMODIUM PULCHELLUM Benth.; F. B. I. ii. 162. *Hedysarum pulchellum* F. I. iii. 361.
Chota Nagpur; E. Bengal; Chittagong.
A stoutish shrub, 3–6 feet high.

606. DESMODIUM UMBELLATUM DC.; F. B. I. ii. 161. *Hedysarum arboreum* F. I. iii. 360.
Sundribuns.
A sea-coast shrub or small tree, reaching 20 feet.

607. DESMODIUM CEPHALOTES Wall.; F. B. I. ii. 161; E. D. D. 332. *Hedysarum Cephalotes* F. I. iii. 360.
Chota Nagpur; Behar; C. Bengal; E. Bengal.
A shrub. *Santal.* Bir jharwar.

607/2. Var. CONGESTA Prain. *Hedysarum umbellatum* F. I. iii. 360, not of Linn.
Chota Nagpur; Chittagong.
A shrub.

608. Desmodium polycarpum DC.; F. B. I. ii. 171. *Hedysarum patens* F. I. iii. 362. *H. purpureum* F. I. iii. 358.
In all the provinces.
An erect or suberect undershrub.

608/2. Var. trichocaulon Bak.; F. B. I. ii. 172.
Chota Nagpur, very rare (on Parasnath and on a hill east of Pitorea); Chittagong.
A suberect undershrub.

609. Desmodium laxiflorum DC.; F. B. I. ii. 164. *Hedysarum recurvatum* F. I. iii. 358. *H. diffusum* F. I. iii. 357, not of Willd.
Chota Nagpur; E. Bengal.
A slender, erect undershrub.

610. Desmodium gangeticum DC.; F. B. I. ii. 168; E. D. D. 339. *Hedysarum gangeticum* F. I. iii. 349. *H. collinum* F. I. iii. 349.
In all the provinces.
A suberect undershrub. *Vernac.* Salpani; *Santal.* Tandi bedi janetet'.

610/2. Var. maculata Bak.; F. B. I. ii. 168.
Tirhut; Behar; Chota Nagpur.
A dwarf undershrub.

611. Desmodium virgatum Zoll. *D. latifolium* F. B. I. ii. 168 partly, not of DC.
Chittagong.
A suberect undershrub.

612. Desmodium latifolium DC.; F. B. I. ii. 168; E. D. D. 341. *Hedysarum latifolium* F. I. iii 350.
Behar; Chota Nagpur; W. Bengal; Tippera; Chittagong.
An erect undershrub. *Santal.* Sim [illegible]atha sura.

613. Desmodium triquetrum DC.; F. B. I. ii. 163 partly. *Hedysarum alatum* F. I. iii. 348.
Chittagong.
A small shrub.

614. Desmodium alatum DC. *D. triquetrum* F. B. I. ii. 163 partly, not of DC.
Chittagong.
An erect shrub.

615. Desmodium pseudotriquetrum DC. *D. triquetrum* F. B. I.

163 partly, not of DC. *Hedysarum triquetrum* F. I. iii. 347, not of Linn.

E. Bengal; N. Bengal.
A diffuse undershrub.

616. DESMODIUM RENIFORME DC.; F. B. I. ii. 173.
N. Bengal.
A diffuse trailing herb.

617. DESMODIUM BRACHYSTACHYUM Grah.; F. B. I. ii. 171.
Chota Nagpur.
A diffuse, trailing herb.

618. DESMODIUM GYRANS DC.; F. B. I. ii. 174. *Hedysarum gyrans* F. I. iii. 351.
In all the provinces, but nowhere plentiful.
An undershrub with motile leaflets. *Beng.* Gora chand. The Semaphore plant.

618/2. Var. ROYLEI Bak.; F. B. I. ii. 175.
Behar; Chota Nagpur; E. Bengal.
An undershrub.

619. DESMODIUM GYROIDES DC.; F. B. I. ii. 175.
N. Bengal, Duars.
A large shrub with very showy flowers.

271. **Alysicarpus** Neck.

Diffuse or erect annual or biennial herbs; *leaves* 1-foliolate, rarely 3-foliolate; stipules scarious, acuminate, free or connate; stipels subulate. *Flowers* small, in terminal, rarely axillary racemes; pedicels short, usually in pairs; bracts scarious, mostly deciduous; bracteoles 0. *Sepals* 5, very slightly connate below; lobes glumaceous or striate, subequal, only the 2 upper connate to near the apex. *Petals* hardly or not exserted; standard obovate or orbicular, narrowed to a claw; wings obliquely oblong, adnate to the keel; keel slightly incurved, obtuse, usually with a lateral appendage on each side. *Stamens* 10; vexillary filament free, the others connate. *Ovary* sessile or shortly stipitate, many-ovuled; style filiform, incurved at the tip; stigma wide-capitate, terminal. *Fruit* a subterete or turgid lomentum, constricted or not between the ovate or globose or oblong and truncate convex or turgid, indehiscent, 1-seeded joints. *Seeds* suborbicular or globose; strophiole 0.

Calyx not exceeding the first joint of the pod :—

Pod moniliform, veinless, turgid ; stems clothed with fine spreading hairs .... *monilifer.*

Pod not moniliform, reticulate-venose :—

Pod compressed ; stems densely clothed with spreading hairs *hamosus.*

Pod terete ; stems glabrescent :—

Stems ascending ; lower leaves usually lanceolate and upper oblong, occasionally lower oblong and upper ovate ; racemes lax *vaginalis.*

Stems more slender, diffusely spreading ; lower leaves always oblong, upper ovate ; racemes dense *vaginalis* var. *nummularifolia.*

Calyx much longer than first joint of pod ; imbricated in fruit :—

Flowers sessile ; calyx densely beset with long, white, cottony hairs *pubescens.*

Flowers shortly pedicelled :—

Pod with 4-cornered joints, transversely plicate ; calyx pubescent and ciliated .... *tetragonolobus.*

Pods with rounded joints ; calyx ciliated only :—

Joints of pod slightly moniliform, neither veined nor rugose :—

Leaves acute, linear or lanceolate ; pods 4–6-jointed *bupleurifolius.*

Leaves obtuse, oblong-lanceolate ; pods 2–3-jointed *bupleurifolius* var. *gracilis.*

Joints of pod turgid, moniliform, deeply transversely plicate :—

Stems suberect or ascending :—

Stems 1–2 feet, ascending, glabrous as are the leaves beneath ; racemes dense .... *rugosus.*

Stems 3–4 feet, suberect, persistently pubescent as are the leaves beneath ; racemes elongated ...*rugosus* var. *Heyneana.*

Stems dwarf, diffuse ; racemes short, dense :—

Stems and leaves beneath finely pubescent *rugosus* var. *styracifolia.*

Stems and leaves beneath glabrous ....*rugosus* var. *minor.*

620. ALYSICARPUS MONILIFER DC. ; F. B. I. ii. 157. *Hedysarum moniliferum* F. I. iii. 345.

Chota Nagpur ; W. Bengal.

A small prostrate weed.

621. ALYSICARPUS HAMOSUS Edgew. ; F. B. I. ii. 157. *Hedysarum procumbens* F. I. iii. 345.

Western Behar.

A small prostrate weed.

622. ALYSICARPUS VAGINALIS DC.; F. B. I. ii. 158. *Hedysarum vaginale* F. I. iii. 345.
In most of the provinces.
A suberect weed, stems 1–3 feet high.

622/1. Var. NUMMULARIFOLIA Bak.; F. B. I. ii. 158; E. D. A. 911.
In all the provinces.
A small prostrate weed.

623. ALYSICARPUS PUBESCENS Law; F. B. I. ii. 160.
Western Behar, very rare.
An erect weed, stems 1–2 feet high.

624. ALYSICARPUS TETRAGONOLOBUS Edgew.; F. B. I. ii. 159.
Behar.
A small prostrate weed.

625. ALYSICARPUS BUPLEURIFOLIUS DC.; F. B. I. ii. 158. *Hedysarum gramineum* F. I. iii. 346.
In all the provinces.
An erect, slender weed. *Beng.* Pan-nata.

625/2. Var. GRACILIS Bak.; F. B. I. ii. 158.
Behar; Chota Nagpur.
An erect, slender weed.

626. ALYSICARPUS RUGOSUS DC.; F. B. I. ii. 159. *Hedysarum bupleurifolium* F. I. iii. 346, not of Linn.
Chota Nagpur; C. Bengal; E. Bengal.
A suberect weed.

626/2. Var. HEYNEANA Bak.; F. B. I. ii. 159. *Hedysarum styracifolium* F. I. iii. 347.
Behar.
An erect weed.

626/3. Var. STYRACIFOLIA Bak.; F. B. I. ii. 159. *Hedysarum glumaceum* F. I. iii. 347.
Chota Nagpur; Behar; W. Bengal.
A diffuse, prostrate weed.

626/4. Var. MINOR Prain.
Chota Nagpur; C. Bengal.
A small prostrate weed.

272. **Psoralea** Linn.

Herbs or undershrubs; *leaves* 1-foliolate or pinnately 3-foliolate (in Indian species); leaflets repand or toothed, gland-dotted (in

Indian species); stipules large, stem-clasping, but hardly adnate to petiole; stipels 0. *Flowers* capitate, spicate, subracemose, or fascicled, rarely solitary, in the axils of reduced floral leaves; bracts membranous often 2–3 flowers to each; bracteoles 0. *Sepals* 5, connate in a campanulate tube; teeth subequal or the lowest longest, the two upper often connate. *Petals* little exserted; standard ovate or orbicular, narrowed to a claw, sometimes auriculate at base; wings oblong, falcate; keel incurved, obtuse, its petals only slightly connate. *Stamens* 10; vexillary filament free or connate with the rest; anthers uniform or alternately attached at higher and lower levels. *Ovary* sessile or shortly stipitate, 1-ovuled; style filiform or dilated below, incurved above; stigma terminal, small. *Fruit* an ovate, indehiscent lomentum. *Seed* often adnate to pericarp; strophiole 0.

627. Psoralea corylifolia Linn.; F. I. iii. 387; F. B. I. ii. 103; E. D. p. 1352.

In all the provinces.

An erect annual, 1–3 feet high. *Hind.* Babachi; *Beng.* Barachi, hakuchi; *Uriya* Bakuchi.

273. **Cyamopsis** DC.

Erect herbs, beset with laterally attached hairs; *leaves* pinnately 3-foliolate (in the Indian species); leaflets toothed; stipules small, setaceous; stipels 0. *Flowers* in axillary racemes; pedicels short, solitary; bracts caducous; bracteoles 0. *Sepals* 5, connate in an oblique tube; lowest tooth longest, setaceous. *Petals* caducous; standard obovate, sessile; wings oblong, not adnate to the erect, obtuse inappendiculate keel. *Stamens* 10, all connate in a tube; anthers uniform, connective apiculate. *Ovary* sessile, many-ovuled; style incurved at tip; stigma terminal, capitate. *Fruit* a linear, suberect pod, subquadrangular, acuminate, septate within. *Seeds* quadrate, compressed; strophiole 0.

628. Cyamopsis psoralioides DC.; F. B. I. ii. 92; E. D. c. 2514. *Dolichos fabæformis* F. I. iii. 316.

An annual crop.

A robust erect plant, 2–3 feet high. *Hind.* Guar; *Santal.* Buru raher.

274. **Indigofera** Linn.

Herbs, undershrubs, or shrubs, with adpressed, laterally attached hairs, occasionally with basifixed hairs intermingled; *leaves* odd-pinnate, rarely simple or 1-foliolate, very rarely digitately 3-foliolate, sometimes pinnately 3-foliolate; leaflets usually opposite except the terminal, occasionally alternate; stipules usually small, shortly adnate; stipels setaceous or 0. *Flowers* usually reddish or purple, in axillary spikes or racemes, solitary sessile or pedicelled in the axils of caducous bracts; bracteoles 0. *Sepals* 5, connate in a minute campanulate calyx; teeth subequal, or the lowest longest. *Petals* caducous; standard ovate or orbicular, sessile or clawed; wings oblong, slightly adnate to the erect, laterally gibbous or spurred keel. *Stamens* 10; vexillary filament free, the others connate; anthers uniform, connective gland-like, apiculate. *Ovary* sessile or subsessile, 1–2 or many-ovuled; style beardless, but the capitate stigma often penicillate. *Fruit* a globose, 1-seeded, or oblong or linear, straight or curved, 3–4-angled or compressed several-seeded pod, septate within. *Seeds* globose, or cylindric and truncate, or compressed or quadrate; strophiole 0.

Leaves simple:—
Pods 1-seeded:—
Pods recurved, sickle-shaped, muricated along the ventral suture *echinata*.
Pods globose, unarmed, minute .... *linifolia*.
Pods 2-seeded .... *cordifolia*.
Leaves compound, odd-pinnate or digitate:—
Leaflets 3—one terminal and a lateral pair:—
Leaves digitately 3-foliolate—end leaflet sessile .... *trifoliata*
Leaves pinnately 3-foliolate—end leaflet stalked:—
Pods short, 1–2-seeded; flowers in dense sessile heads; leaflets oblanceolate, thinly pubescent; a herb..................... *glandulosa*.
Pods elongated, 4-angled, 6–10-seeded; flowers in racemes about 1 in. long; leaflets obovate, grey-silky; a woody undershrub... *trita*.
Leaflets 5 or more:—
Leaflets distinctly alternate; leaves sessile or nearly so:—
Leaflets silvery-hoary, 7–9; pods 2-seeded; flowers in dense sessile heads.. *enneaphylla*.
Leaflets sparsely adpressed-hirsute, 5–9; pods straight, 6–10-seeded; flowers in close racemes, 1–4 in. long......... *endecaphylla*.
Leaflets opposite—one terminal and 2 or more lateral pairs:—
*Branches, petioles, and pods densely covered with viscid, gland-tipped hairs; racemes laxly 6–12-flowered; leaflets 7–9 oblanceolate; pods faintly torulose, straight, 10–12-seeded; a diffuse herb [p. 431] .... *viscosa*.

*Branches, petioles, and pods not viscidly hairy :—[p. 430]

Stems and pods densely clothed with short, spreading pubescence ; racemes very dense, 2–6 in. long ; leaflets 5–11, large, obovate ; pod short, straight, 6–8-seeded ; a suberect herb *hirsuta.*

Stems and pods sparingly hirsute or grey-canescent or glabrous:—

Racemes 2–4-flowered, short, lax ; leaflets always 5 ; stems and branches sparsely hairy, slender ; pods glabrous, 8–12-seeded ; a diffuse, tufted herb .... *glabra.*

Racemes many-flowered, elongated ; erect woody undershrubs or shrubs :—

Flowers small ; leaflets membranous ; pods often recurved :—

Pods green, 8–12-seeded ; leaflets 9–13, obovate, green :—

Pods few, slender, 10–12-seeded, acute ; leaflets hardly longer than broad ; racemes shorter than leaves *tinctoria.*

Pods many, stout, 8–10-seeded, blunt ; leaflets longer than broad ; racemes as long as leaves ......*sumatrana.*

Pods silvery, stout, 3–4-seeded ; leaflets 7–9, obovate, often silvery beneath ....*articulata* var. *Houer.*

Flowers large ; leaflets 13–17, subcoriaceous ; pods straight, 8–12-seeded, sutures thickened ....*arborea.*

629. INDIGOFERA ECHINATA Willd. ; F. I. iii. 370 ; F. B. I. ii. 92.

Western Behar ; Chota Nagpur.

A diffuse branched annual weed.

630. INDIGOFERA LINIFOLIA Retz ; F. I. iii. 370 ; F. B. I. ii. 92 ; E. D. I. 134.

In all the provinces except Chittagong.

A wiry tufted annual weed. *Hind.* Motiyari, torki ; *Beng.* Bhangra ; *Santal.* Tandi khode baha.

631. INDIGOFERA CORDIFOLIA Heyne ; F. B. I. ii. 93 ; E. D. I. 121.

Behar ; Chota Nagpur.

A diffuse branched annual weed.

632. INDIGOFERA TRIFOLIATA Linn. ; F. B. I. ii. 96. *I. prostrata* F. I. iii. 373.

Chota Nagpur ; W. Bengal ; C. Bengal.

A perennial weed of waste places.

633. INDIGOFERA GLANDULOSA Willd. ; F. I. iii. 372 ; F. B. I. ii. 94 ; E. D. I. 131.

Western Behar, rare.

An annual slender branching weed.

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634. INDIGOFERA TRITA Linn. f.; F. I. iii. 371; F. B. I. ii. 96.
Chota Nagpur, rare.
A woody undershrub, 2–3 feet high.

635. INDIGOFERA ENNEAPHYLLA Linn.; F. I. iii. 376; F. B. I. ii. 94; E. D. I. 125.
Chota Nagpur; W. Bengal.
A weed of waste places. *Hind.* Latahai.

636. INDIGOFERA ENDECAPHYLLA Jacq.; F. B. I. ii. 98.
Western Behar, rare.
A diffuse weed of waste places.

637. INDIGOFERA VISCOSA Lamk; F. I. iii. 377; F. B. I. ii. 95.
C. Bengal.
A tufted branching herb.

638. INDIGOFERA HIRSUTA Linn.; F. I. iii. 376; F. B. I. ii. 98.
Chota Nagpur; N. Bengal; W. Bengal.
A suberect herb, 2–4 feet high. *Hind.* Chhota sirphonka.

639. INDIGOFERA GLABRA Linn. *I. fragrans* F. I. iii. 375. *I. pentaphylla* F. B. I. ii. 95.
Chota Nagpur, very common.
An annual tufted weed.

640. INDIGOFERA TINCTORIA Linn.; F. B. I. ii. 99 partly.
Chota Nagpur; Behar: rare, not cultivated in our area.
A twiggy shrub. *Hind.* Jinjini. Ceylon Indigo.

641. INDIGOFERA SUMATRANA Gaertn. *I. tinctoria* F. I. iii. 379; F. B. I. ii. 99 partly; E. D. I. 145: not of Linn.
Cultivated, chiefly Tirhut; occasionally spontaneous in Tamarisk jungles and on river-banks.
A shrub with twiggy woody branches. *Hind.* & *Beng.* Nil. Bengal Indigo.

642. INDIGOFERA ARTICULATA Gouan var. HOUER. *I. cœrulea* F. I. iii. 377. *I. argentea* var. *cœrulea* F. B. I. ii. 99; E. D. I. 109.
Behar; not now cultivated in our area.
A shrub with twiggy woody branches. *Hind.* Surmai-nil. Surat Indigo.

Neither "Surat," formerly grown in our area, nor "Bengal," which has displaced it, is native. Three others are sometimes grown: "Guatimala" (*I. guatimalensis* Moç & Sessé); "W. Indian" (*I. suffruticosa* Mill.: *I. Anil* Linn.); "E. African" or "Natal" (*I. arrecta*

Hochst.). "Natal," like "Bengal," has 8–10-seeded pods, but is a much larger plant; its leaflets are not obovate. The other two, like "Surat," have 3–4-seeded pods, in "Guatimala" straight, in "W. Indian" falcate; in both the leaflets are more numerous and ovate-acute, while their pods are not silvery-grey and are more slender.

643. INDIGOFERA ARBOREA Roxb.; F. I. iii. 381. *I. purpurascens* F. I. iii. 383. *I. elliptica* F. I. iii. 380. *I. violacea* F. I. iii. 380. *I. pulchella* F. B. I. ii. 101; E. D. I. 141: hardly of Roxb.

Chota Nagpur, very common.

A shrub or small tree. *Hind.* Sakina, lakina; *Santal.* Dane-huter, lili bichi.

275. **Sophora** Linn.

Trees or shrubs; *leaves* odd-pinnate; leaflets subopposite or opposite; stipules lanceolate, deciduous; stipels setaceous or 0. *Flowers* showy; in simple terminal racemes or leafy panicles; bracts linear, caducous; bracteoles 0. *Sepals* 5, connate in an oblique, wide-campanulate calyx; teeth deltoid, very short. *Petals* all clawed, much exserted; standard wide-ovate or orbicular, erect or spreading; wings oblong, oblique; keel oblong, nearly straight, its segments imbricate or connate. *Stamens* 10, free; anthers versatile. *Ovary* shortly stipitate, many-ovuled; style incurved; stigma small, terminal. *Fruit* a moniliform, cylindric or slightly compressed, rarely winged, coriaceous or woody lomentum or pod. *Seeds* obovoid or globose; strophiole 0.

644. SOPHORA BAKERI Clarke. *S. sp.* F. B. I. ii. 251.

Chota Nagpur.

A shrub.

276. **Ormosia** Jacks.

Erect trees; *leaves* odd-pinnate; leaflets opposite; stipules small; stipels usually 0. *Flowers* in terminal panicles; bracts small; bracteoles minute, linear. *Sepals* 5, connate in a short campanulate tube; teeth long, the upper two shortest and widest, subconnate. *Petals* little exserted, all short-clawed; standard suborbicular; wings oblong, obtuse, as are the usually imbricate keel-petals. *Stamens* 10 or by abortion 5–9, free, all fertile or 2–5 without anthers; anthers versatile. *Ovary* subsessile, 2–many-ovuled; style filiform; stigma introrse, oblique. *Fruit* an oblong or occasionally elongated pod, woody or coriaceous, continuous or septate within. *Seed* obovate or oblong, arillate or not; testa shining; funicle cartilaginous.

645. ORMOSIA ROBUSTA Wight; F. B. I. ii. 252.

Chittagong.

A large tree; seeds arillate.

277. **Dalhousiea** Grah.

A straggling or scandent shrub; *leaves* 1-foliolate; leaflet large; stipules ovate-lanceolate; stipels 0. *Flowers* in axillary or terminal, sometimes branching corymbs; bracts opposite, stipule-like, ovate, subcordate, persistent; bracteoles like bracts but rather larger, hiding the flowers. *Sepals* 5, connate in a campanulate calyx; teeth very short, deltoid. *Petals* exserted, almost sessile; standard orbicular; wings oblique, obovate; keel-petals obtuse, slightly incurved, subconnate. *Stamens* 10; filaments free; anthers uniform, versatile. *Ovary* subsessile, 2–4-ovuled; style slightly incurved; stigma small, terminal. *Fruit* an obliquely oblong, much impressed, coriaceous pod, continuous within. *Seeds* 2–3, suborbicular, compressed; strophiole 0.

646. DALHOUSIEA BRACTEATA Grah.; F. B. I. ii. 248. *Podalyria bracteata* F. I. ii. 317.

Chittagong.

A subscandent shrub. *Vernac.* Gupuri.

Suborder II. CÆSALPINIEÆ.

Trees or shrubs, rarely herbs; *leaves* very rarely simple or 1-foliolate, usually pinnate or 2-pinnate, with often numerous leaflets; stipels 0 or very rare. *Flowers* irregular, rarely regular, hermaphrodite, never capitate, very rarely spicate. *Sepals* 5, or 4 from union of the upper pair, separate as far as the margin of the short or elongated disk, usually much below the middle, into distinct, imbricate, rarely valvate lobes; very rarely the sepals connate above the middle and beyond the disk in a lobed limb. *Petals* 5 or fewer by abortion, rarely 0, the upper inmost, the others variously imbricate, the lowest pair not connate. *Stamens* 10 or fewer by abortion, rarely numerous; free or occasionally some or all shortly or distinctly connate. *Carpel* free or adherent by a gynophore to the disk lining the calyx-tube. *Seeds* with or without albumen.

Leaves simply pinnate or (*Bauhinia*) 1-foliolate :—

Anthers basifixed ; petals 5 ; leaves even-pinnate ....**Cassia.**

Anthers versatile :—

Corolla complete, with 5 petals ; calyx-lobes 5 ; stamens free :—

Leaves 1-foliolate, 2-lobed ; stamens 10 or 3 or 1 ; seeds albuminous ....**Bauhinia.**

Leaves even-pinnate, 2–3-, rarely 1-jugate ; stamens 10 or many ; seeds without albumen ....**Cynometra.**

Corolla incomplete, with petals fewer than 5 or 0 ; leaves even-pinnate :—

Petals absent :—

Calyx-lobes 5, green ; stamens 10 ; leaflets 1–3-jugate ; flowers small..................**Hardwickia.**

Calyx-lobes 4, coloured ; stamens 3–8 ; leaflets 4–6-jugate ; flowers showy ....**Saraca.**

Petals present ; calyx-lobes 4 :—

Petals 3 ; stamens 3, monadelphous ; leaflets many-jugate, small ....**Tamarindus.**

Petal 1 ; stamens 3, free ; leaflets few-jugate, large ......**Intsia.**

Leaves 2-pinnate ; anthers versatile :—

Stamens 5 ; calyx-lobes equal ; leaves with a distinct main-rachis **Acrocarpus.**

Stamens 10 :—

Leaves with a short, spinescent main-rachis, the 4–8 pinnæ simulating a fasciculus of simply pinnate leaves ; calyx-lobes subequal **Parkinsonia.**

Leaves with a distinct main-rachis :—

Calyx-segments valvate :—

Calyx-lobes subequal, green..................**Poinciana.**

Calyx-lobes unequal, the 4 upper connate, the lower free, all coloured..................**Colvillea.**

Calyx-segments imbricate, very unequal, the lowest large, boat-shaped, and enclosing the others :—

Pod winged ....**Mezoneuron.**

Pod wingless..................**Cæsalpinia.**

278. Cassia Linn.

Trees, shrubs, or, less often, herbs ; *leaves* even-pinnate ; stipules various ; stipels 0 ; inter-foliolar glands often present. *Flowers* usually showy, in axillary racemes or terminal panicles, rarely subsolitary axillary ; bracts and bracteoles present, various. *Sepals* 5, imbricate above, at the base very shortly connate in a disk-lined tube. *Petals* 5, imbricate, spreading, subequal or the lower larger, the upper inmost in bud. *Stamens* 10, all perfect and equal, or the 3 lower larger than the 7 upper, or 7 lower perfect, the 3 upper much smaller and sterile, or 5 perfect, the alternate stamens reduced or absent; anthers uniform or those of the 3 lowest stamens longer; locules dehiscing by an apical pore or short chink, rarely by a basal opening. *Ovary* sessile or stipitate, free within calyx-tube, often curved, many-ovuled; style short or long; stigma terminal, capitate or truncate, rarely ciliolate or swollen. *Fruit* a terete, woody lomentum, septate within, or a flattened pod, woody, coriaceous or membranous, and usually septate or occluded within, occasionally longitudinally winged externally. *Seeds* transverse, rarely longitudinal, horizontally or vertically compressed, occasionally subtetragonous, albuminous.

*Sepals broad, obtuse :—[p. 437]
- Pods indehiscent, woody, terete; stamens 10, all fertile, the 3–2 lowest larger than the rest; trees :—
  - Leaflets 4–8 pairs, large; flowers yellow, in long racemes; bracts deciduous, minute .... *Fistula.*
  - Leaflets 6–12 pairs, medium; flowers pink, in short corymbs; bracts large, persistent .... *nodosa.*
- Pods dehiscent, compressed, rarely (*C. bicapsularis*) turgid and subterete :—
  - Stamens 10, all perfect; anthers subequal; a shrub............ *glauca.*
  - Stamens only 7 perfect :—
    - †Leaf-rachis furnished with glands :—[p. 437]
      - Leaves with one large gland near base of common petiole :—
        - Leaflets 3–5-jugate, ovate-oblong; pods flattened, impressed between the seeds .... *occidentalis.*
        - Leaflets 6–12-jugate, oblong-lanceolate; pods slightly turgid, not impressed between the seeds :—
          - Branches green .... *Sophera.*
          - Branches purplish; leaflets smaller...*Sophera* var. *purpurea.*
      - Leaves with one or more glands on the main-rachis, between the bases of leaflets :—
        - Stipules large, foliaceous, persistent; a tall shrub *auriculata.*
        - Stipules narrow, caducous :—
          - ‡Stamens very unequal; pod thick, membranous, terete; seeds 2-seriate; leaflets obtuse, 3–4-jugate; a shrub [p. 437] *bicapsularis.*

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‡Stamens subequal; pod long, slender, sub-4-angled; seeds 1-seriate; leaflets obtuse, 3-jugate; herbs:—[p. 436]

Leaflets glaucescent beneath, fœtid; leaf-rachis with 2 glands, 1 between each of the lower pair of leaflets *Tora.*

Leaflets green beneath, not fœtid; leaf-rachis with only 1 gland, between lowest pair of leaflets ....*obtusifolia.*

†Leaf-rachis without any glands:—[p. 436]

Pod with a broad wing down the middle of each valve; leaflets very large, oblong; flowers in dense, spicate heads; a shrub *alata.*

Pod with no wing; leaflets medium, ovate-oblong; flowers in racemed corymbs; trees:—

Stipules persistent, foliaceous; sutures of pod thin *timorensis.*

Stipules caducous, minute; sutures of pod thickened...*siamea.*

*Sepals narrow, acute; pod small, ligulate, dehiscent; low shrubs, undershrubs or herbs:—[p. 436]

Leaflets 2-jugate, medium, ovate, membranous, distant............*Absus.*

Leaflets very many, small, narrow, rigidly coriaceous, close-set:—

Gland of petiole stipitate:—

Stamens 5 ....*pumila.*

Stamens 10 ....*Kleinii.*

Gland of petiole sessile...*mimosoides.*

647. Cassia Fistula Linn.; F. I. iii. 333; F. B. I. ii. 261; E. D. C. 756.

In all the provinces; often only planted.

A medium tree. Amaltas or Indian Laburnum. *Beng.* & *Hind.* Amaltas; *Santal.* Nurnic'; *Uriya* Sonári.

648. Cassia nodosa Ham.; F. I. ii. 336; F. B. I. ii. 261; E. D. C. 777.

Chittagong; often planted elsewhere.

A tree.

649. Cassia glauca Lamk; F. B. I. ii. 265; E. D. C. 769. *Senna arborescens* F. I. ii. 345.

Planted.

A shrub.

650. Cassia occidentalis Linn.; F. B. I. ii. 262; E. D. C. 780 *Senna occidentalis* F. I. ii. 343.

In all the provinces, in waste places.

A diffuse undershrub. *Hind.* Kasondi; *Beng.* Kalkashonda.

651. Cassia Sophera Linn.; F. B. I. ii. 262; E. D. C. 787. *Senna sophora* F. I. ii. 347. *S. esculenta* F. I. ii. 346.
In all the provinces, in waste places.
A small shrub. *Hind.* Kasondi; *Beng.* Kalkashonda.

651/2. Var. purpurea Bak.; F. B. I. ii. 263. *Senna purpurea* F. I. ii. 342.
Behar; W. Bengal.
A small shrub. *Beng.* Lal Kalkashonda.

652. Cassia auriculata Linn.; F. B. I. ii. 263. *Senna auriculata* F. I. ii. 349.
In hedges and near villages in most of the provinces.
A tall shrub. *Hind.* Tarwar.

653. Cassia bicapsularis Linn.; F. B. I. ii. 263. *Senna bicapsularis* F. I. ii. 342.
In C. Bengal, near villages; introduced, not plentiful.
A bushy shrub.

654. Cassia Tora Linn.; F. B. I. ii. 263 partly; E. D. C. 797. *Senna Tora* F. I. ii. 340.
In all the provinces, very common; in waste places.
An annual fœtid weed. *Vernac.* Chakunda.

655. Cassia obtusifolia Linn. *C. Tora* F. B. I. ii. 263 partly, not of Linn. *Senna toroides* F. I. ii. 340.
Chota Nagpur.
An annual weed. *Santal.* Chakoada arak'.

656. Cassia alata Linn.; F. B. I. ii. 264; E. D. C. 732. *Senna alata* F. I. ii. 349.
In most of the provinces, near villages; not uncommon.
A shrub, with thick, rather soft, downy branches. *Vernac.* Dádmardán.

657. Cassia timorensis DC.; F. B. I. ii. 265; E. D. C. 795.
Planted, rather generally, especially in the eastern parts.
A small tree.

658. Cassia siamea Lamk; F. B. I. ii. 264; E. D. C. 785. *Senna sumatrana* F. I. ii. 347.
Planted in most of the provinces.
A tree.

659. Cassia Absus Linn.; F. B. I. ii. 265; E. D. C. 728. *Senna Absus* F. I. ii. 340. *S. exigua* F. I. ii. 339.
Chota Nagpur; W. Bengal; Behar; Tirhut.
An erect annual, 1–2 feet high. *Hind.* Chaksu, banar.

GSL

660. CASSIA PUMILA Lamk; F. B. I. ii. 266. *C. mimosoides* E. D. C. 775. *Senna prostrata* F. I. ii. 352.
Chota Nagpur; W. Bengal; Behar.
A low prostrate undershrub. *Hind.* Chota aura; *Santal.* Patwa-ghas.

661. CASSIA KLEINII W. & A.; F. B. I. ii. 266.
Behar, western parts, rare.
A low prostrate undershrub.

662. CASSIA MIMOSOIDES Linn.; F. B. I. ii. 266. *Senna sensitiva* F. I. ii. 353. *S. tenella* F. I. ii. 354.
Chota Nagpur; N. and E. Bengal.
A low prostrate undershrub. *Santal.* Ot kondro.

279. **Bauhinia** Linn.

Trees or shrubs, erect or climbing, when climbing, sometimes with flattened stems, and often with simple, circinate tendrils; *leaves* simple, 3-many-nerved, rarely entire mucronate, usually 2-lobed with mucronate sinus, from more or less complete union of 2 connate leaflets, sometimes the 2 leaflets quite free, with the petiole aristate between their bases; stipules usually small, occasionally large, caducous. *Flowers* usually showy, racemose; racemes simple, terminal, or rarely axillary, sometimes in spreading or corymbose terminal panicles. *Sepals* 5, connate in a short, turbinate, disk-lined tube with large imbricate lobes, or in a long cylindric or clavate tube, with lobes imbricate or valvate or closed before flowering and then bursting valvately or opening as a split spathe. *Petals* 5, slightly unequal, erect or spreading, usually distinctly clawed, imbricate, the upper petal innermost. *Stamens* 10 perfect, free or nearly so, or 9 perfect, the axillary filament sterile or wanting, or 5 perfect, the alternate filaments sterile or wanting, or 3, occasionally 4, perfect, the rest sterile or wanting, or 1 (the lowest) perfect, the others reduced to short, connate staminodes; anthers versatile, dehiscing longitudinally. *Ovary* stipitate, many-ovuled, the stipe free within the calyx-tube or adnate to the disk; style short or filiform; stigma terminal or slightly oblique, capitate or lobed or peltate. *Fruit* an oblong or linear pod or lomentum, flattened, woody, continuous rarely occluded or septate within. *Seeds* orbicular or ovate, compressed, albuminous.

Fertile stamens more than one :—

Fertile stamens 10 ; calyx with a very short tube ; pod narrow ; shrubs without tendrils :—

Pod dehiscent ; calyx-limb spathaceous :—

Flowers white, in close axillary racemes ; calyx-limb subulately 5-toothed at the tip ; pod ribbed near upper suture......*acuminata.*

Flowers yellow, the standard red-blotched within, usually in axillary pairs ; calyx-limb entire ; pod not ribbed near upper suture..*tomentosa.*

Pod indehiscent :—

Calyx-limb spathaceous ; flowers in lax racemes ; pod falcate, not venulose and not long-beaked :—

Leaves ⅓-cleft, 2·25 in. wide, 2 in. long or larger ; pod 1 in. wide..*racemosa.*

Leaves ⅔-cleft, ·75 in. wide, ·5 in. long or less ; pod ·5 in. wide *rufescens.*

Calyx-limb 5-cleft ; flowers in short corymbs ; pod nearly straight, closely reticulate-venulose along the centre, beaked by the long, persistent style ....*malabarica.*

Fertile stamens almost always 3, rarely 4–5 :—

Calyx-tube very short ; limb 5-cleft :—

Flowers minute, white, in copious terminal panicles ; pod indehiscent, distinctly stalked, 1–2-seeded, under 2 in. long ; a climber with tendrils and flattened stems with tense margins and a loose undulate centre ; lobes of leaves usually acute at apex ...*anguina.*

Flowers medium, yellow, in terminal racemes ; pod at length dehiscent, very shortly stalked, 6–8-seeded, 5–6 in. long ; an erect shrub without tendrils ; lobes of leaves indistinct, rounded at apex...*retusa.*

Calyx-tube elongated :—

Flowers medium ; petals densely silky ; large climbers with tendrils ; leaves deeply cleft :—

Leaves 9-nerved with acute lobes, almost glabrous beneath ; calyx-limb regularly 5-cleft ; pod indehiscent, 2–4-seeded *macrostachya.*

Leaves 11–13-nerved with obtuse lobes, densely pubescent beneath ; calyx-limb 2-cleft ; pod at length dehiscent, 8–12-seeded... *Vahlii.*

Flowers large ; petals glabrous ; erect trees ; leaves not deeply cleft, lobes rounded ; tendrils 0 ; pod late of dehiscing :—

Calyx-limb entire, spathaceous, equalling the cylindric tube ; flowers appearing when tree is nearly leafless ....*variegata.*

Calyx-limb irregularly 3–5-cleft, longer than the turbinate tube ; flowers appearing with leaves ....*purpurea.*

Fertile stamen solitary ; calyx-tube long, fusiform, limb spathaceous ; pod flat, late of dehiscing ; a shrub ; tendrils 0 ....*monandra.*

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663. Bauhinia acuminata Linn.; F. I. ii. 324; F. B. I. ii. 276; E. D. B. 295.

Planted and self-sown in village shrubberies in all the provinces.

A shrub. *Hind.* Kanchnar; *Beng.* Kanchan.

664. Bauhinia tomentosa Linn.; F. I. ii. 323; F. B. I. ii. 275; E. D. B. 334.

Planted in most of the provinces.

A shrub. *Hind.* Kanchnar.

665. Bauhinia racemosa Lamk; F. B. I. ii. 276; E. D. B. 318. *B. parviflora* F. I. ii. 323.

Chota Nagpur.

A small bushy tree with pendulous branches.

Beng. Banraj; *Hind.* Gurial; *Kol.* Kaimu; *Uriya* Ambhota.

666. Bauhinia rufescens Lamk; F. B. I. ii. 277.

In gardens, especially in the central parts.

A shrub.

667. Bauhinia malabarica Roxb.; F. I. ii. 321; F. B. I. ii. 277; E. D. B. 304.

Chota Nagpur.

A medium-sized, bushy tree. *Beng.* Karmai; *Hind.* Amlosa; *Uriya* Gumbati; *Kol.* Laba.

668. Bauhinia anguina Roxb.; F. I. ii. 328; F. B. I. ii. 284; E. D. B. 297.

Chittagong.

A large climber. *Vernac.* Nagpat.

669. Bauhinia retusa Ham.; F. I. ii. 322; F. B. I. ii. 279; E. D. B. 330.

Chota Nagpur.

A small tree. *Kol.* Laba; *Oraon* Twar; *Hind.* Kanla.

670. Bauhinia macrostachya Wall.; F. B. I. ii. 281: E. D. B. 301. *B. scandens* F. I. ii. 326.

Chittagong.

An extensive climber. *Beng.* Ganda-gila.

671. Bauhinia Vahlii W. & A.; F. B. I. ii. 278; E. D. B. 342. *B. racemosa* F. I. ii. 325.

W. Bengal; Chota Nagpur.

An extensive climber. *Beng.* Chehur; *Hind.* Malghan; *Uriya* Sheoli.

672. Bauhinia variegata Linn.; F. I. ii. 319; F. B. I. ii. 284. *B. candida* F. I. ii. 318.

Chota Nagpur; Behar; Tirhut; N. Bengal; Chittagong; in other provinces often planted.

A medium-sized tree; the flowers vary a good deal in colour; those trees with pure white flowers constitute *B. candida* Roxb. *Beng.* Rakto kanchan, swet kanchan; *Hind.* Khairwal; *Kol.* Singya; *Santal.* Jingya; *Uriya* Borara.

673. Bauhinia purpurea Linn.; F. I. ii. 320; F. B. I. ii. 284. *B. triandra* F. I. ii. 320.

Chota Nagpur; Behar; N. and E. Bengal; in other provinces often planted.

A medium-sized tree; the flowers are of two colours, purplish-pink and pale purple. The trees with purplish-pink flowers, which only occasionally occur and are always planted, constitute the true *B. purpurea;* the pale-flowered trees constitute *B. triandra* Roxb., which is more commonly planted than the other, and is the only wild form in our area. *Hind.* Kaliari; *Beng.* Koiral, Deva kanchan; *Santal.* Singyara.

674. Bauhinia monandra Kurz; F. B. I. ii. 285.

Occasionally planted.

A shrub; native of Madagascar. *Beng.* Belati kanchan.

280. **Cynometra** Linn.

Trees or large shrubs; leaves odd-pinnate; leaflets few, opposite, coriaceous; stipules caducous; stipels 0. *Flowers* small, in short, often fascicled racemes, axillary or on old wood; bracts ovate, dry, imbricate, at length deciduous, decreasing upwards; bracteoles 0 or membranous and coloured. *Sepals* usually 4, rarely 5, connate in a very short tube with subbasal disk; lobes oblong, imbricate, at length reflexed. *Petals* 5, almost included, oblanceolate, subequal, or the 2 lowest smaller. Stamens 10, rarely many; filaments free, filiform, exserted; anthers small, oblong, versatile; dehiscence longitudinal. *Ovary* sessile or shortly stipitate, 2-ovuled, free or obliquely adnate to disk; style filiform; stigma terminal, capitate or truncate. *Fruit* a turgid, slightly ovoid or subreniform, indehiscent lomentum, or rarely a pod, with very thick, tough, somewhat fleshy pericarp. *Seed*

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thick or compressed, occupying the whole cavity of the fruit; cotyledons thick, fleshy; albumen 0; hilum ventral.

Stamens 10; leaf-rachis glabrous:—
  Flowers on stem and thick branches in racemes with a produced axis; pedicels glabrous; leaves 1-jugate............................*cauliflora.*
  Flowers among the leaves in axly umbelliform corymbs without a produced axis; pedicels puberulous; leaves 2-jugate
ramiflora var. *mimosoides.*
Stamens 40–60; leaf-rachis puberulous; leaves 3-jugate ......*polyandra.*

675. CYNOMETRA CAULIFLORA Linn.; F. B. I. ii. 268; E. D. C. 2572.
Occasionally planted.
A small tree.

676. CYNOMETRA RAMIFLORA Linn. var. MIMOSOIDES Bak.; F. B. I. ii. 267. *C. ramiflora* E. D. C. 2577.
Sundribuns.
A medium-sized littoral tree. *Beng.* Shingar.

677. CYNOMETRA POLYANDRA Roxb.; F. I. ii. 372; F. B. I. ii. 268; E. D. C. 2574.
Chittagong; occasionally planted elsewhere.
A medium-sized tree. *Vernac.* Peng.

281. Hardwickia Roxb.

Trees; *leaves* even-pinnate; leaflets 1–3-jugate, coriaceous; stipules small, caducous; stipels 0. *Flowers* small, in paniculate racemes; bracts minute; bracteoles under calyx scale-like. *Sepals* 5, less often 4, hardly connate round the basal disk, petaloid, orbicular, much imbricate. *Petals* 0. *Stamens* 10 or 8, alternately longer and shorter; anthers versatile, dehiscence longitudinal. *Ovary* sessile, free, 2-ovuled; style filiform; stigma peltate or capitate. *Fruit* a dry lomentum or follicle with the upper ovule alone developed into a seed which fills the whole cavity or only the tip of the fruit, the base then being thin and samaroid. *Seed* pendulous, obovate, somewhat compressed; albumen 0.

678. HARDWICKIA BINATA Roxb.; F. I. ii. 423; F. B. I. ii. 270; E. D. H. 16.
Behar.
A tall tree. *Vernac.* Anjan.

282. Saraca Linn.

Trees or large shrubs; *leaves* even-pinnate; leaflets coriaceous; stipules small, connate, intrapetiolar; stipels 0. *Flowers* racemose, in condensed panicles, usually from old wood; bracts small, deciduous; bracteoles subpersistent coloured. *Sepals* 4, connate in a long, disk-bearing tube; the lobes oblong, hardly equal, petaloid, much imbricate. *Petals* 0. *Stamens* usually 7, rarely 3–4; filaments long, filiform; anthers versatile; dehiscence longitudinal. *Ovary* stipitate, stipe adnate below to disk and produced beyond it; ovules many; style long, filiform; stigma small, capitate. *Fruit* a flattened, oblong, firmly coriaceous or almost woody pod, continuous within. *Seeds* thick, flattened or subterete; albumen 0.

679. SARACA INDICA Linn.; F. B. I. ii. 271; E. D. S. 861. *Jonesia Asoca* F. I. ii. 218.

Generally planted; wild in Chittagong.

A low tree. *Vernac.* Asoka.

283. Tamarindus Linn.

A tree; *leaves* even-pinnate; leaflets opposite, many, small; stipules minute, caducous; stipels 0. *Flowers* in racemes at the ends of branches; bracts ovate; bracteoles ovate-oblong, somewhat coloured. *Sepals* 4, connate below in a narrowly turbinate disk-lined tube; lobes lanceolate, membranous, imbricate. *Petals* 3, imbricate, the uppermost inmost, subsessile and narrower than the ovate lateral, the 2 lowest represented by bristles or scales. *Stamens* 3 perfect, connate in a sheath split above, with free portion of filaments short; anthers oblong, versatile; dehiscence longitudinal; staminodes a few minute bristles on the sheath. *Ovary* stipitate, many-ovuled; stipe adnate to disk-lined calyx-tube; style filiform; stigma terminal, subtruncate. *Fruit* an oblong or linear indehiscent, incurved, thick, subcompressed lomentum with brittle epicarp, pulpy mesocarp, and leathery endocarp, septate within. *Seeds* obovate-orbicular, compressed; testa firm; albumen 0.

680. TAMARINDUS INDICA Linn.; F. I. ii. 215; F. B. I. ii. 273; E. D. T. 28.

Generally planted.

A tall tree. *Beng.* Tintuli, tinturi; *Hind.* Amli, titar.

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284. Intsia Thouars.

Trees; *leaves* even-pinnate; leaflets coriaceous, opposite, few-paired; stipules minute, intrapetiolar, deciduous, or 0; stipels 0. *Flowers* rather conspicuous, in short panicles at ends of branches; bracts ovate, usually deciduous; bracteoles ovate, subpersistent, hardly enclosing the bud. *Sepals* 4, connate in a long disk-lined tube; lobes slightly unequal, decussately imbricate. *Petal* 1, clawed, orbicular. *Stamens* 3, a lowest single and a lateral pair with a pair of intervening staminodes, and with 2 pairs of staminodes between lateral stamens and petal; filaments filiform, pilose; anthers small, oblong; dehiscence longitudinal. *Ovary* stipitate, many-ovuled; stipe adnate below to disk-lined calyx-tube and produced beyond it; style long, filiform; stigma subtruncate. *Fruit* an obliquely oblong, much flattened, firmly coriaceous, indehiscent lomentum, occluded between the seeds. *Seeds* transverse, orbicular, much compressed, with slender funicle; albumen 0.

681. INTSIA RETUSA O. Kuntze. *Jonesia triandra* F. I. ii. 220. *Afzelia retusa* F. B. I. ii. 274. *A. bijuga* E. D. A. 580 partly.

Sundribuns.

A littoral tree. *Beng*. Hinga, somdal.

285. Acrocarpus W. & A.

Erect trees; *leaves* twice-pinnate; pinnæ odd-pinnate; leaflets ovate, acuminate, herbaceous, opposite except the terminal; stipules deciduous; stipels 0. *Flowers* appearing before the leaves, in dense axillary solitary, or terminal fascicled racemes; bracts small, oblong; bracteoles small, caducous. *Sepals* 5, connate in a campanulate, disk-lined calyx; teeth lanceolate, as long as tube. *Petals* 5, narrow, subequal, somewhat exserted. *Stamens* 5, free, exserted, straight; anthers versatile; dehiscence longitudinal. *Ovary* stipitate, many-ovuled; stipe free from disk; style short, incurved; stigma minute, terminal. *Fruit* a flat, ligulate pod, upper suture winged. *Seeds* obovate, oblique, compressed; strophiole 0.

682. ACROCARPUS FRAXINIFOLIUS Wight; F. B. I. ii. 292; E. D. A. 440.

Chittagong.

A tall tree.

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286. Parkinsonia Linn.

Small armed trees; *leaves* 2-pinnate with a very short, spinescent main-rachis; pinnæ with much flattened rachis, even-pinnate; leaflets many, small; stipules spinescent; stipels 0. *Flowers* long-pedicelled in short, lax, axillary racemes; bracts small, caducous; bracteoles 0. *Sepals* 5, connate in a short, disk-lined tube; lobes slightly unequal, membranous, little imbricate. *Petals* 5, spreading, the uppermost inmost rather wider than the rest. *Stamens* 10, villous below; anthers versatile; dehiscence longitudinal. *Ovary* shortly stipitate, many-ovuled; stipe free from disk; style filiform, infolded in bud; stigma terminal, minute. *Fruit* a linear, torulose pod, opening late; valves coriaceous or almost woody. *Seeds* oblong, elongated, albuminous; hilum almost apical.

683. PARKINSONIA ACULEATA Linn.; F. B. I. ii. 260; E. D. P. 322.

Planted, but also as if wild in all the provinces.

A large shrub. *Vernac.* Belati kikar.

287. Poinciana Linn.

Tall trees; *leaves* 2-pinnate; leaflets many, small; stipules small; stipels 0. *Flowers* showy, in terminal corymbs; bracts small, caducous; bracteoles 0. *Sepals* 5, connate in a very short, disk-lined tube; segments valvate, subequal. *Petals* 5, orbicular, imbricate, subequal or the uppermost innermost dissimilar. *Stamens* 10, declinate, free; filaments villous below; anthers uniform; dehiscence longitudinal. *Ovary* sessile, many-ovuled, free from the disk; style filiform or short clavate; stigma truncate, ciliolate. *Fruit* a flattened, woody, straight pod, continuous within. *Seeds* transverse, oblong, albuminous; hilum small.

684. POINCIANA REGIA Boj.; F. B. I. ii. 260; E. D. P. 1035.

Planted in most of the provinces.

A medium-sized spreading tree. The Gold-Mohur Tree.

This was introduced to India from Mauritius; the general supposition that it is a native of Madagascar does not appear to be correct; whence it came to Mauritius is not exactly known.

288. Colvillea Boj.

Tall trees; *leaves* 2-pinnate; leaflets many, small; stipules small; stipels 0. *Flowers* showy, in dense subpaniculate racemes with thickened rachis; bracts membranous, coloured, caducous; bracteoles 0. *Sepals* 5, connate in a very short, disk-lined tube; segments induplicate-valvate, the 4 upper united for some distance after the flower opens, the lowest usually quite free. *Petals* 5, imbricate, the uppermost innermost widest, the lateral obovate, the lowest outermost narrow. *Stamens* 10, declinate, free; filaments villous below; anthers uniform; dehiscence longitudinal. *Ovary* subsessile, many-ovuled, free from the disk; style somewhat thickened; stigma small, terminal. *Fruit* a thick, straight, elongated, turgid pod. *Seeds* transverse, oblong; hilum small.

685. COLVILLEA RACEMOSA Boj.

Planted occasionally in most of the provinces.

A medium-sized tree; introduced from Mauritius.

289. Mezoneuron Desf.

Prickly, woody climbers; *leaves* abruptly 2-pinnate; pinnæ abruptly pinnate; leaflets small, numerous, or large, few; stipules small or obsolete; stipels 0. *Flowers* racemose, racemes axillary or in terminal panicles; bracts narrow; bracteoles 0. *Sepals* 5, connate in a short, very oblique, disk-lined tube; segments imbricate, the lowest outermost large, boat-shaped. *Petals* 5, orbicular, spreading, much imbricate, subequal, or the uppermost inmost dissimilar. *Stamens* 10, declinate, free, glabrous or pilose; anthers uniform; dehiscence longitudinal. *Ovary* sessile or shortly stipitate, 2–many-ovuled; stipe or base free from disk; style subulate, apex obliquely clavate; stigma terminal, minute or concave and ciliolate. *Fruit* a thin, flattened lomentum, longitudinally winged along the upper suture. *Seeds* transverse, compressed, orbicular or reniform; albumen 0.

Pod 1-seeded; leaflets 4–5-jugate, large, ovate-acute; stamens much exceeding the calyx:—
  Leaflets 2 in. or less long; wing of pod ·4 in. or less wide...*cucullatum*.
  Leaflets 3 in. or more long; wing of pod ·5 in. or more wide *cucullatum* var. *grandis*.
Pod 4–6-seeded; leaflets 9–11-jugate, small, oblong, obtuse, ·5 in. long or less; stamens slightly exceeding the calyx..................*enneaphyllum*.

686. MEZONEURON CUCULLATUM W. & A.; F. B. I. ii. 258.
Cæsalpinia cucullata F. I. ii. 358.

Chota Nagpur; N. Bengal.

A very extensive climber.

686/2. Var. GRANDIS Bak.; F. B. I. ii. 258.
Behar; Chota Nagpur; Chittagong.
A very extensive climber.

687. MEZONEURON ENNEAPHYLLUM W. & A.; F. B. I. ii. 258.
Cæsalpinia enneaphylla F. I. ii. 363.
Chittagong.
A climbing shrub.

290. Cæsalpinia Linn.

Trees or shrubs or climbers, prickly or unarmed; *leaves* abruptly 2-pinnate; pinnæ abruptly pinnate; leaflets many small, or fewer, firmer, larger; stipules various; stipels 0. *Flowers* often showy, in lax racemes in the upper leaf-axils or in dense panicles at ends of branches; bracts caducous; bracteoles 0. *Sepals* 5, connate in a short, disk-lined tube; lobes 5, imbricate, the lowest largest concave outermost. *Petals* 5, orbicular or oblong, usually clawed, spreading, slightly unequal, imbricate, the uppermost innermost. *Stamens* 10, free, declinate; filaments villous or glandular at base; anthers uniform; dehiscence longitudinal. *Ovary* sessile, its base free from the disk, few-ovuled; style usually terete, filiform, rarely clavate; stigma terminal, minute, truncate or concave. *Fruit* an oblong or ligulate, thin, flattened or turgid pod, sometimes spiny outside, usually occluded between the seeds, or an indehiscent, coriaceous or almost fleshy, subturgid lomentum. *Seeds* transverse, ovate to orbicular; albumen 0.

Pod armed with abundant wiry prickles; petals narrow ......*Bonducella.*
Pod unarmed; petals broad:—
  Pod dry, thin-valved, with narrow sutures:—
    Leaflets few, coriaceous, large; pods short; seeds solitary or rarely 2 *Nuga.*
    Leaflets many, membranous or only subcoriaceous, small; pods longer than broad; seeds 5–8:—
      Stamens long, far exserted; petals long-clawed; pods thin, strap-shaped ....*pulcherrima.*
      Stamens short, little exserted; petals short-clawed:—
        Stipules 0; petals subequal; pod wingless, broadly blunt-pointed, with a recurved beak..................................*Sappan.*
        Stipules large; upper petal smaller than the others; pod narrowly winged along the ventral suture, round-pointed, with a straight beak ....*sepiaria.*
  Pod somewhat fleshy, thick-valved, with widened sutures, turgid, torulose, 2–4-seeded..*digyna.*

688. Cæsalpinia Bonducella Flem.; F. I. ii. 357; F. B. I. ii. 254; E. D. C. 6.
N. and C. Bengal; Chota Nagpur; Sundribuns.
An extensive climber. *Hind.* Kat-karanj; *Beng.* Nata karanj; *Santal.* Bagni.

689. Cæsalpinia Nuga Ait.; F. B. I. ii. 255; E. D. C. 30. *C. paniculata* F. I. ii. 364.
Sundribuns; Chittagong, coast.
An extensive, shrubby climber.

690. Cæsalpinia pulcherrima Sw.; F. B. I. ii. 255; E. D. C. 32. *Poinciana pulcherrima* F. I. ii. 355.
In all the provinces, planted.
A shrub in gardens or hedges; flowers either red or yellow. *Beng.* Krisha chura.

691. Cæsalpinia Sappan Linn.; F. I. ii. 357; F. B. I. ii. 255: E. D. C. 35.
Planted in some of the provinces.
A large shrub or small tree. *Hind.* and *Beng.* Bakam, patang; *Santal.* and *Hind.* Teri; *Uriya* Bokmo.

692. Cæsalpinia sepiaria Roxb.; F. I. ii. 360; F. B. I. ii. 256; E. D. C. 42.
In most of the provinces, especially in the western and northern; used as a hedge-plant.
A shrubby climber. *Hind.* Uri, relu, kando.

693. Cæsalpinia digyna Rottb.; F. B. I. ii. 256; E. D. C. 26. *C. oleosperma* F. I. ii. 356.
Chota Nagpur; Behar; N. Bengal; Chittagong.
A climber. *Beng.* Amal-kochi; *Hind.* Vakeri-mal.

Suborder III. MIMOSEÆ.

Trees or shrubs, rarely herbs; *leaves* always compound, 2-pinnate or rarely simply pinnate. *Flowers* regular, sometimes polygamous, almost always capitate or spicate. *Sepals* 5, sometimes 4, rarely 3 or 6, valvate, very rarely imbricate, connate below in a 5-toothed or 5-lobed, less often 4-, 3-, or 6-lobed calyx with no disk lining the tube, or sepals free. *Petals* as many as sepals, valvate, free, or sometimes connate in a lobed corolla, hypogynous or slightly perigynous. *Stamens* as many as sepals or petals or both, sometimes numerous, free or monadelphous or adnate to tube of corolla. *Carpel* free. *Seeds* sometimes arillate, with little or 0 albumen; embryo with flat cotyledons.

Anthers gland-tipped; stamens 5–10:—

Calyx-teeth short, imbricated; filaments usually either connate or adnate at base; inflorescence capitate, heads large; trees......**Parkia.**

Calyx valvate; filaments free:—

Inflorescence elongated:—

Large tendril-bearing climbers; leaves with few leaflets; pod very long and wide; seeds huge; flowers sessile; leaflets opposite **Entada.**

Trees or shrubs without tendrils; leaves with many leaflets; pods narrow:—

Flowers shortly stalked; leaflets fairly large, not contiguous, alternate on the secondary rachis; unarmed trees; pods narrow, at length contorted ....**Adenanthera.**

Flowers sessile; leaflets small, opposite; armed shrubs:—

Pod turgid, with thick, edible mesocarp; leaflets small, not contiguous ....**Prosopis.**

Pod thin, coriaceous, at length contorted; leaflets minute, contiguous ....**Dichrostachys.**

Inflorescence capitate, heads small:—

Small aquatic or subaquatic herbs, with small, thin pods, opening early by upper suture ....**Neptunia.**

Lofty trees with large, thick, woody pods, late in dehiscing, opening by both sutures..**Xylia.**

Anthers not gland-tipped; calyx valvate, rarely 0:—

Filaments free:—

Stamens definite, as many or twice as many as petals; shrubs or undershrubs with capitate flowers and thin, coriaceous pods:—

Pods straight, with continuous valves, dehiscing through sutures:—

Undershrubs with clavate stigmas ....**Desmanthus.**

Large shrubs or small trees with capitate stigmas......**Leucæna.**

Pods slightly curved, with usually segmented valves and always indehiscent, persistent sutures..................................**Mimosa.**

Stamens indefinite, often very numerous; flowers spicate or capitate ....**Acacia.**

Filaments more or less connate, usually indefinite, rarely only 2–3 times as many as petals:—

*Pod not septate between the seeds:—[p. 451]

†Pod straight, with thin valves:—[p. 451]

‡Sutures thin; pod indehiscent, or if dehiscent, the valves not opening elastically [p. 451] ....**Albizzia.**

‡Sutures thickened; pod revolutely dehiscent, the valves opening elastically from apex to base [p. 450] ....**Calliandra.**

†Pod twisted, with coriaceous valves [p. 450] ......**Pithecolobium.**

*Pod septate between the seeds, indehiscent; valves spongy or fleshy; sutures thickened [p. 450]...................................**Enterolobium.**

291. **Parkia** R.Br.

Tall, unarmed trees; *leaves* abruptly 2-pinnate; pinnæ even-pinnate; leaflets very many, small, opposite; stipules minute; stipels 0. *Flowers* numerous, in dense, clavate or subglobose, long-peduncled axillary solitary, or terminal paniculate heads; bracts ligulate, spathulate; lowest flowers male or neuter. *Sepals* 5, connate in a small tubular calyx, tube adnate to petals or free; lobes short, imbricate, somewhat 2-lipped. *Petals* 5, linear-spathulate, connate to the middle or free, valvate or subvalvate. *Stamens* 10, exserted, connate below, and there adnate to corolla or rarely free from the petals; anthers oblong, gland-tipped; pollen clustered, the clusters 2-seriate. *Ovary* sessile or stipitate, many-ovuled; style filiform; stigma small, capitate, terminal. *Fruit* a large, flat, ligulate, ultimately dehiscing, coriaceous or fleshy pod, sometimes long-stipitate. *Seeds* transverse, thick, compressed or ovoid.

Petiole with two glands placed side by side; leaflets on each pinna 60–100-jugate; heads subspherical.................................*biglandulosa.*

Petiole with one gland; leaflets on each pinna 40–80 pairs; heads somewhat clavate ....*Roxburghii.*

694. PARKIA BIGLANDULOSA W. & A.; F. B. I. ii. 289. *Mimosa pedunculata* F. I. ii. 551.

Often planted.

A tall tree.

695. PARKIA ROXBURGHII G. Don; F. B. I. ii. 289. *Mimosa biglobosa* F. I. ii. 551.

Chittagong; sometimes planted in Bengal.

A tall tree. *Beng.* Sapota.

292. **Entada** Adans.

Very large, woody climbers; *leaves* 2-pinnate, the ultimate pinnæ sometimes modified as tendrils without leaflets; stipules small, setaceous; stipels 0. *Flowers* in slender spikes, sometimes along the branches, sometimes paniculate; uniform hermaphrodite

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or polygamous; bracts minute, triangular or subulate; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; teeth short. *Petals* 5, free or slightly connate, valvate. *Stamens* 10, free, little exserted, filiform; anthers shortly oblong, gland-tipped; pollen-granules many. *Ovary* subsessile, many-ovuled; style filiform; stigma terminal, truncate, concave. *Fruit* a huge, straight or curved, firmly coriaceous or woody lomentum with thickened, persistent, continuous sutures, pericarp separating from the transversely articulated endocarp, which breaks away in 1-seeded joints. *Seeds* large, orbicular, compressed, hilum small.

696. ENTADA PURSÆTHA DC. *E. scandens* F. B. I. ii. 287; E. D. E. 219. *Mimosa scandens* F. I. ii. 554.
Chittagong; Chota Nagpur; Orissa.
A large climber. *Beng.* Gila; *Uriya* Geredi.

293. **Adenanthera** Linn.

Erect, unarmed trees; *leaves* 2-pinnate; pinnæ opposite, but their leaflets alternate, even-pinnate; stipules very minute, caducous; stipels 0. *Flowers* in slender, subspicate racemes, either solitary axillary, or terminal and panicled; bracts 0; bracteoles 0. *Sepals* 5, connate in a campanulate tube; lobes short. *Petals* 5, connate below, valvate. *Stamens* 10, free, hardly exserted; anthers oblong, gland-tipped; pollen-granules numerous. *Ovary* sessile, many-ovuled; style filiform; stigma small, terminal. *Fruit* a linear, falcate, torulose pod, septate within, the valves coriaceous, much twisted after dehiscence. Seeds small, hard, polished, pink or pink with black eye, often with a thin, pulpy covering.

697. ADENANTHERA PAVONINA Linn.; F. I. ii. 370; F. B. I. ii. 287; E. D. A. 471.
Chittagong; Tippera.
A tree. *Beng.* Rakto-kanchan, ranjan.

294. **Prosopis** Linn.

Shrubs or trees, with scattered prickles; *leaves* evenly 2-pinnate; pinnæ usually few-paired; leaflets many, narrow, coriaceous; stipules small or 0, sometimes spinescent; stipels 0; interfoliolar glands usually present but small. *Flowers* small, in narrow spikes or in subspicate, long-peduncled racemes; bracts 0; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; teeth short.

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Petals 5, ligulate, valvate, subconnate at base. *Stamens* 10, free, slightly exserted; filaments filiform; anthers ovate, gland-tipped. *Ovary* stipitate or sessile, many-ovuled; style filiform; stigma terminal, small. *Fruit* a linear, compressed or subterete, indehiscent lomentum, straight or twisted, septate within; mesocarp thick, spongy; endocarp thin, firm. *Seeds* usually ovate, compressed.

698. Prosopis spicigera Linn.; F. B. I. ii. 288; E. D. p. 1459. *Adenanthera aculeata* F. I. ii. 371.

Behar; sometimes planted in other provinces.

A small tree. *Hind.* Jhand; *Beng.* and *Uriya* Shami.

295. **Dichrostachys** DC.

Shrubs; branches here and there spinescent; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets many, opposite, small; stipules lanceolate; stipels 0. *Flowers* in cylindric, often nodding, peduncled spikes on short, axillary branchlets, the uppermost flowers ⚥ yellow, the lower neuter purplish; bracts minute or 0; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; teeth short. *Petals* 5, connate below, valvate. *Stamens* 10, free, shortly exserted; anthers ovate, tipped by stalked glands; pollen-granules many. *Ovary* subsessile, many-ovuled; style filiform; stigma terminal, truncate. *Fruit* a linear, twisted, coriaceous, indehiscent or irregularly disarticulating lomentum, continuous within. *Seeds* obovate, compressed.

699. Dichrostachys cinerea W. & A.; F. B. I. ii. 288. *Mimosa cinerea* F. I. ii. 561.

Orissa, Khurda.

A large shrub. *Vernac.* Vurtuli.

296. **Neptunia** Lour.

Perennial herbs or undershrubs, branches often compressed or angled; *leaves* evenly 2-pinnate; leaflets small, sensitive; stipules persistent; stipels 0. *Flowers* small, in ovate-globose, peduncled, solitary axillary heads; upper flowers ⚥, lower ♂, lowest neuter with protruding, flattened staminodes; bracts minute; bracteoles 0. *Sepals* 5, connate in a campanulate tube; teeth short. *Petals* 5, connate below or free, valvate. *Stamens* in ⚥ and ♂ flowers 10, rarely 5, free, exserted, tipped by a stipitate gland; pollen in numerous granules; staminodes in neuter flowers 10, petaloid, exserted. *Ovary* stipitate, many-ovuled; style filiform; stigma small, terminal, concave. *Fruit* an obliquely oblong or ligulate, flattened, coriaceous pod. *Seeds* transverse, ovate, compressed.

Stems prostrate or nearly so; leaflets of a pinna 8–15-jugate; pod oblique, oblong, 6–10-seeded ....*oleracea.*
Stems ascending, stout; leaflets of a pinna 20–30-jugate; pod oblong-ligulate, 15–20-seeded..*plena.*

700. NEPTUNIA OLERACEA Lour.; F. B. I. ii. 285; E. D. N. 76. *Mimosa natans* F. I. ii. 553.
C. Bengal, in jheels.
A widely creeping marsh plant. *Beng.* Pani-najak.

701. NEPTUNIA PLENA Benth.; F. B. I. ii. 286. *Mimosa Adenanthera* F. I. ii. 554.
C. Bengal, introduced only.
A stoutish marsh-plant; native of America. *Beng.* Belati pani-najak.

297. **Xylia** Benth.

A tall, hard-wooded tree; *leaves* evenly 2-pinnate; pinnæ 1-jugate; leaflets opposite, even-pinnate, large, few; stipules small, linear, deciduous; stipels 0; interfoliolar glands few. *Flowers* in globose, peduncled heads, peduncles fascicled in leaf-axils or racemose at ends of branches; bracts 0; bracteoles 0. *Sepals* 5, connate in a short, tubular-campanulate calyx; teeth distinct. *Petals* 5, slightly connate below, valvate. *Stamens* 10, alternately shorter and longer, free, exserted; anthers gland-tipped. *Ovary* sessile, many-ovuled; style filiform; stigma small, capitate. *Fruit* a sessile, broadly falcate, flat, very thickly woody pod, dehiscing elastically but tardily; septate within. *Seeds* oblong, much compressed.

702. XYLIA DOLABRIFORMIS Benth.; F. B. I. ii. 286; E. D. X. 16. *Mimosa xylocarpa* F. I. ii. 543.
Orissa, Khurda.
A tall tree. *Uriya* Boja, kongora.

298. **Desmanthus** Willd.

Perennial herbs or undershrubs; branches striate or angular; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets small; stipules setaceous; stipels 0. *Flowers* in ovate-globose heads, on solitary axillary peduncles; all ☿ or the lower neuter, sometimes

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apetalous; bracts 0; bracteoles 0. *Sepals* 5, connate in a campanulate, shortly toothed calyx. *Petals* 5, free or slightly connate, valvate. *Stamens* 10 or 5; filaments free, filiform; anthers ovate, not gland-tipped; pollen-granules numerous. *Ovary* subsessile, many-ovuled; style subulate or clavate; stigma small, terminal, concave. *Fruit* a linear, straight, coriaceous pod, continuous or subseptate within. *Seeds* longitudinal or oblique, ovate, compressed.

703. DESMANTHUS VIRGATUS Willd.; F. B. I. ii. 290.
C. Bengal, naturalised, but rare.
A perennial undershrub with twiggy branches.

299. **Leucæna** Benth.

Shrubs or small trees; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets small many, or fewer larger; stipules small or setaceous; stipels 0. *Flowers* in globose heads, the lower or all on long, fascicled, axillary peduncles, sometimes the upper panicled terminal; bracts usually 2, under the flower-head or lower on the peduncle; bracteoles 0. *Sepals* 5, connate in a tubular calyx; teeth short. Petals 5, free, valvate. *Stamens* 10, free, exserted; anthers ovate, often pilose, not gland-tipped; pollen-granules numerous. *Ovary* stipitate, many-ovuled; style filiform; stigma terminal, small. *Fruit* a stipitate, flat, ligulate, coriaceous pod, continuous within. *Seeds* transverse, ovate, compressed.

704. LEUCÆNA GLAUCA Benth.; F. B. I. ii. 290; E. D. L. 306.
Chota Nagpur; C. Bengal: naturalised.
A large shrub or small tree; native of America.

300. **Mimosa** Linn.

Prickly and bristly herbs or shrubs; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets small, sensitive or subsensitive, ligulate, caducous; stipules small; stipels often 2 to each pinna. *Flowers* small, in globose heads on axillary, solitary, or fascicled peduncles, the upper peduncles sometimes in terminal racemes; bracts 0; bracteoles 0. *Sepals* 4, connate in a campanulate calyx; teeth short. *Petals* 4, connate below, valvate. *Stamens* 4 or 8, much exserted; filaments free, filiform; anthers ovate, not gland-tipped; pollen-granules many. *Ovary* stipitate, many-ovuled; style filiform; stigma minute, terminal. *Fruit* a flat, membranous, disarticulating lomentum, the 1-seeded joints separating when ripe from the persistent sutures; subseptate or continuous within. *Seeds* ovate or orbicular, flattened.

Stamens as many as petals; rachis of leaf bristly; stem bristly and prickly; pinnæ digitately congested; sutures of pod very prickly; small undershrubs ....*pudica.*
Stamens twice as many as petals; rachis of leaf smooth; stem prickly but not bristly; leaves 2-pinnately compound; sutures of pod unarmed or with only a few prickles; large shrubs or small trees ......*rubricaulis.*

705. MIMOSA PUDICA Linn.; F. I. ii. 564; F. B. I. ii. 291; E. D. M. 557.

In all the provinces, by roadsides.

An undershrub. *Hind.* Lajalu, lajwati; *Beng.* Lajak. The Sensitive Plant; a very troublesome weed.

706. MIMOSA RUBRICAULIS Lamk; F. B. I. ii. 291; E. D. M. 562. *M. octandra* F. I. ii. 564.

Chota Nagpur; W. Bengal; C. Bengal.

A straggling, prickly shrub. *Hind.* Shiah-kanta; *Beng.* Shiah-kanta, kuchi-kanta; *Santal.* Sega janum.

301. Acacia Willd.

Trees, or erect or climbing shrubs; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets small; stipules small or conspicuous, sometimes spinescent; stipels 0. *Flowers* in cylindric spikes or globose heads; peduncles axillary solitary or fascicled, or terminal panicled; bracts usually 2, at apex or in middle, less often at base of peduncle; bracteoles 0. *Sepals* 5 or 4, rarely 3, connate in a campanulate, shortly toothed calyx. *Petals* 5 or 4, exserted, connate below. *Stamens* many, exserted, free or shortly connate at base; anthers small, not gland-tipped; pollen masses 2–4 in each cell. *Ovary* sessile or stipitate, 2–many-ovuled; style filiform; stigma small, terminal. *Fruit* a ligulate or oblong, flat and dry, or rarely turgid and subcoriaceous pod, or an indehiscent lomentum, continuous or occluded or septate within, but never disarticulating; sutures not thickened. *Seeds* transverse or longitudinal, usually ovate or compressed; funicle filiform or subarillate.

*Trees or erect shrubs, the branches armed with diverging stipulary or infra-stipulary spines, but without prickles:—[p. 457]

†Flowers in elongated axillary spikes; spines short, slightly recurved; pods thin, flat, sutures not sinuate:—[p. 457]

GSL

Bark white; calyx downy, not much shorter than the pale petals; pinnæ 10–20-jugate; leaflets 30–50-jugate........................*Suma.*

Bark brown; calyx less than half as long as the dark-yellow petals; pinnæ 20–40-jugate; leaflets 30–50-jugate:—

Calyx, petals, and rachis covered with spreading hairs ...*Catechu.*

Calyx and petals glabrous; rachis puberulous ....*catechuoides.*

†Flowers in globose heads; spines long and straight:—[p. 456]

Heads axillary:—

Flowers yellow:—

Pod with a pulpy mesocarp and 2-seriate seeds, thick, short, cylindric, glabrous, with straight sutures; pinnæ 4–8-jugate; leaflets 10–20-jugate...*Farnesiana.*

Pod coriaceous with 1-seriate seeds, compressed, elongated:—

Pod thickened, valves depressed, and sutures rather deeply sinuate between the seeds, finely grey-downy; pinnæ 3–6-jugate; leaflets 10–20-jugate.......................................*arabica.*

Pod thin, flat, sutures not sinuate between the seeds, quite glabrous; pinnæ 2–5-jugate; leaflets 6–8-jugate ......*eburnea.*

Flowers purple; pod thin, flat, sutures not sinuate between the seeds, thinly grey-downy; pinnæ 6–12-jugate; leaflets 20–30-jugate...*tomentosa.*

Heads in ample terminal panicles; flowers yellow; pod thin, flat, sutures not sinuate, closely tomentose; pinnæ 6–12-jugate; leaflets 15–30-jugate ....*leucophlœa.*

*Climbing shrubs without stipulary spines, but with many recurved prickles along the branches; flowers in globose, amply paniculate heads:—[p. 456]

Pod thick, succulent, somewhat depressed between the seeds, sutures slightly sinuate, when ripe shrivelled and rugose; pinnæ 6–8-jugate; leaflets 15–25-jugate; flowers yellowish ....*concinna.*

Pod thin, coriaceous, flat, sutures not sinuate; flowers whitish:—

Leaflets not close-set, oblong-ligulate, glabrous beneath, 8–12-jugate; pinnæ 6–8-jugate; ovary and pod glabrous ....*Intsia.*

Leaflets close-set:—

Ovary and pod pubescent; pinnæ 6–8-jugate; leaflets oblong-ligulate, pubescent beneath, 10–20-jugate ....*Cæsia.*

Ovary and pod glabrous; pinnæ 8–16-jugate; leaflets narrow-linear, 40–50-jugate:—

Rachis rather closely pubescent with no prickles ....*pennata.*

Rachis usually quite glabrous and almost always armed beneath with prickles; if slightly pubescent then prickly, if without prickles then glabrous.......................*pennata* var. *arrophula.*

707. Acacia Suma Ham.; F. B. I. ii. 294; E. D. A. 291. *Mimosa Suma* F. I. ii. 563.
Chota Nagpur; W. Bengal.
A medium-sized tree. *Beng.* San-kanta.

708. Acacia Catechu Willd.; F. B. I. ii. 295; E. D. A. 135. *Mimosa Catechu* F. I. ii. 563.
Behar; Chota Nagpur; Orissa; E. Bengal, Madhupur jungles.
A medium-sized tree. *Hind.* Khair, khair-babul; *Beng.* and *Santal.* Khayar.

709. Acacia catechuoides Wall. *A. catechu* F. B. I. ii. 295 partly. *Mimosa catechuoides* F. I. ii. 562.
C. N. and E. Bengal.
A medium-sized tree. *Beng.* Khayar.

710. Acacia Farnesiana Willd.; F. B. I. ii. 292; E. D. A. 217. *Mimosa Farnesiana* F. I. ii. 557.
Planted rather commonly, especially in the western provinces.
A shrub or small tree. *Vernac.* Belati babul, guhiya babul; *Santal.* Gabur.

711. Acacia arabica Willd.; F. B. I. ii. 293; E. D. A. 101. *Mimosa arabica* F. I. ii. 557.
Tirhut; Behar; C. Bengal.
A tree. *Vernac.* Babul, kikar.

712. Acacia eburnea Willd.; F. B. I. ii. 293; E. D. A. 215.
Western Behar.
A tree.

713. Acacia tomentosa Willd.; F. B. I. ii. 294; E. D. A. 299. *Mimosa tomentosa* F. I. ii. 558.
Central Bengal; Sundribuns.
A small tree.

714. Acacia leucophlœa Willd.; F. B. I. ii. 294; E. D. A. 249. *Mimosa leucophlœa* F. I. ii. 558.
Orissa, Khurda.
A shrub. *Beng.* Safed-babul; *Uriya* Goira.

715. Acacia concinna DC.; F. B. I. ii. 296; E. D. A. 200. *Mimosa concinna* F. I. ii. 565.
N. Bengal; Chittagong.
A large climber. *Hind.* Ritha; *Beng.* Ban-ritha.

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716. Acacia Intsia Willd.; F. B. I. ii. 297; E. D. A. 233. *Mimosa Intsia* F. I. ii. 565.
Sundribuns; Chittagong.
An extensive climber.

717. Acacia Cæsia W. & A. *A. Intsia* var. *Cæsia* F. B. I. ii. 297; E. D. A. 233. *Mimosa Cæsia* F. I. ii. 565.
W. Bengal; Chota Nagpur; Orissa; E. Bengal, Madhupur jungles.
A large climber. *Santal.* Kondro-janum; *Kol.* Kandaru.

718. Acacia pennata Willd.; F. B. I. ii. 297. *Mimosa pennata* F. I. ii. 565. *M. torta* F. I. ii. 566.
W. Bengal; Chota Nagpur.
A large climber. *Hind.* Biswal; *Kond.* Kundaru; *Santal.* Undaru.

718/2. Var. arrophula Bak.; F. B. I. ii. 298.
Chittagong.
A large climber.

302. **Albizzia** Duraz.

Considerable trees, rarely climbing shrubs; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets large few, or medium numerous, or small very many; stipules small or obsolete, rarely large, subfoliaceous; stipels 0. *Flowers* in globose heads, rarely cylindric spikes; peduncles distinct, axillary or panicled at ends of branches; bracts 2 or 0; bracteoles 0. *Sepals* 5, connate in a campanulate or tubular calyx; teeth or lobes short. *Petals* 5, connate below in a funnel-shaped corolla; lobes valvate. *Stamens* numerous, connate below in a tube, somewhat exserted; anthers small; pollen-granules 2–4 in each cell. *Ovary* sessile or stipitate, many-ovuled; style filiform; stigma small, capitate. *Fruit* a ligulate, dry, compressed, thin pod or lomentum, continuous within; sutures not thickened, and valves neither elastic nor spiral. *Seeds* ovate or orbicular, compressed; funicle filiform.

Climbing shrubs, the pulvinus below the leaf-base enlarged into a short, firm, recurved hook; leaflets numerous, narrow-linear, with a median main-nerve, close-set ....*myriophylla.*
Erect, usually tall trees; pulvinus not persistent:—
*Stipules very large; leaflets numerous, narrow, with main-nerve nearest upper margin, hardly close-set [p. 460] ....*stipulata.*

*Stipules small:—[p. 459]

Leaflets numerous, narrow, close-set:—

Leaflets narrowly ovate with median main-nerve; main-rachis pubescent with spreading hairs; flower-heads solitary or fasciculate in axils of leaves..*amara*.

Leaflets linear with main-nerve nearest upper margin; main-rachis puberulous with very short hairs; flower-heads in axillary corymbs..*Richardiana*.

Leaflets ovate, not close-set:—

Leaflets obtuse, never more than 2 in. long:—

Leaflets 8–24-jugate, main-nerve nearer the upper margin; main-rachis with one basal and 1–2 distal glands between bases of the upper pairs of pinnæ......................*odoratissima*.

Leaflets usually fewer; leaves with 1 basal gland on main-rachis, but none between bases of the distal pairs of pinnæ:—

Main-nerve rather nearer lower than upper margin; heads copiously panicled, florets sessile; leaflets 6–12-jugate; pinnæ 2–6-jugate; pods brownish ....*procera*.

Main-nerve median; heads not panicled, florets pedicelled; leaflets 5–9-jugate; pinnæ 2–3- (less often 4-, rarely 1-) jugate; pods pale..*Lebbek*.

Leaflets acuminate, the terminal pairs 4 in. long, 1–2- (rarely 3-) jugate; main-nerve median; pinnæ 1–2-jugate..............*lucida*.

719. ALBIZZIA MYRIOPHYLLA Benth.; F. B. I. ii. 300. *Mimosa myriophylla* F. I. ii. 549.

Chittagong.

A climbing shrub. *Vernac.* Tituliya.

720. ALBIZZIA STIPULATA Boiv.; F. B. I. ii. 300; E. D. A. 722. *Mimosa stipulata* F. I. ii. 549. *M. Smithiana* F. I. ii. 550.

Chota Nagpur; N. Bengal; Chittagong.

A tall tree. *Hind.* Siran; *Beng.* Amlukia.

721. ALBIZZIA AMARA Boiv.; F. B. I. ii. 300; E. D. A. 686. *Mimosa amara* F. I. ii. 548. *M. pulchella* F. I. ii. 548.

Orissa; sometimes planted elsewhere.

A small tree.

722. ALBIZZIA RICHARDIANA King & Prain.

Planted in C. Bengal.

A tall, handsome tree; native of Madagascar. *Beng.* Belati amlukia.

723. ALBIZZIA ODORATISSIMA Benth.; F. B. I. ii. 299; E. D. A. 711. *Mimosa odoratissima* F. I. ii. 546.
Behar; Chota Nagpur; Chittagong; but often planted in other provinces.
A tall tree. *Santal.* Jang siris.

724. ALBIZZIA PROCERA Benth.; F. B. I. ii. 299; E. D. A. 717. *Mimosa procera* F. I. ii. 548.
In all the provinces.
A tall, handsome tree. *Beng.* Koroi; *Hind.* Safed siris.

725. ALBIZZIA LEBBEK Benth.; F. B. I. ii. 298; E. D. A. 695. *Mimosa Sirissa* F. I. ii. 544.
Generally planted.
A medium tree. *Vernac.* Siris, sirissa.

726. ALBIZZIA LUCIDA Benth.; F. B. I. ii. 299; E. D. A. 709. *Mimosa lucida* F. I. ii. 544.
C. Bengal; E. Bengal; Chittagong.
A medium tree. *Beng.* Sil-koroi.

303. **Calliandra** Benth.

Shrubs or trees; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets (in our species) large; stipules persistent; stipels 0. *Flowers* in globose heads; peduncles axillary or in terminal racemes, solitary or subfascicled; bracts 0; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; limb toothed. *Petals* 5, connate in a deeply cleft corolla; lobes valvate. *Stamens* numerous, monadelphous below; filaments filiform, much exserted; anthers minute; pollen-granules in each cell 2–4. *Ovary* stipitate, many-ovuled; style filiform; stigma terminal, capitate, minute. *Fruit* a ligulate, somewhat curved, flat, rigidly coriaceous pod, continuous within; sutures much thickened; valves dehiscing elastically from the tip backwards. *Seeds* obovate or orbicular, compressed.

727. CALLIANDRA UMBROSA Benth.; F. B. I. ii. 302.
Chittagong.
A small tree.

304. **Pithecolobium** Mart.

Tall trees; *leaves* evenly 2-pinnate; pinnæ even-pinnate; stipules small or conspicuous, sometimes spinescent; stipels 0. *Flowers* in globose heads, on solitary, subfascicled or racemed peduncles, axillary at the ends of branches; bracts small, stipellar, or 0; bracteoles 0. *Sepals* 5, rarely 6, connate in a campanulate or tubular calyx; teeth very short. *Petals* 5, rarely 6, connate in a tubular corolla with long, valvate lobes. *Stamens* numerous, far exserted, connate below in a tube; anthers small; pollen-granules in each cell 2–4. *Ovary* sessile or stipitate, many-ovuled; style filiform; stigma minute, capitate. *Fruit* a ligulate, circinate, less often only falcate, usually much twisted pod, or less often an indehiscent lomentum, with unthickened sutures. *Seeds* sometimes arillate or embedded in pulp, ovate or orbicular, compressed.

Stipules spinescent; pinnæ and obtuse leaflets each 1-jugate; seeds half-covered by a white, pulpy, edible aril ....*dulce*.
Stipules not spinescent; pinnæ 2–3-jugate, and large, acute leaflets 3–6-jugate; seeds not arillate ....*angulatum*.

728. Pithecolobium dulce Benth.; F. B. I. ii. 302; E. D. P. 900. *Mimosa dulcis* F. I. ii. 556.
Planted everywhere, but often also self-sown.
A medium tree; often also trimmed as a hedge. Native of Tropical America. *Vernac.* Belati amli; dekhani babul.

729. Pithecolobium angulatum Benth.; F. B. I. ii. 306. *Mimosa heterophylla* F. I. ii. 545.
Chittagong; Tippera.
A tall tree.

305. Enterolobium Mart.

Erect trees; *leaves* evenly 2-pinnate; pinnæ even-pinnate; leaflets opposite; stipules small, lanceolate; stipels 0. *Flowers* in globose heads, on solitary or subfasciculate peduncles, axillary or the upper racemose; bracts lanceolate; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; teeth triangular. *Petals* 5, connate in a funnel-shaped corolla; teeth short, valvate. *Stamens* numerous; filaments much exserted, connate below; anthers small; pollen in 2–4 granules in each cell. *Ovary* sessile, many-ovuled; style filiform; stigma small, terminal. *Fruit* a ligulate, compressed, indehiscent lomentum, septate within between the seeds; epicarp crustaceous; mesocarp hard or spongy or pulpy; endocarp cartilaginous, continuous with the septa. *Seeds* transverse, compressed; funicle slender.

730. Enterolobium Saman Prain; E. D. A. 720; P. 909.
Planted; especially in Central and Eastern parts.
A medium-sized spreading tree; pods pulpy. Native of Tropical America.

Order XLVII. ROSACEÆ.

Herbs, shrubs, sometimes sarmentose or climbing, or trees. *Leaves* alternate, rarely opposite, simple or compound; stipules 2, free, or adnate to petiole, very rarely obsolete. *Flowers* usually regular and hermaphrodite. *Disk* lining the calyx-tube or forming a ring at its base. *Sepals* connate in a tube, adnate to the ovary or free; limb usually 5-lobed, the fifth lobe uppermost; lobes usually persistent, often bracteolate, imbricate or valvate. *Petals* 5, rarely 0, inserted below the margin of the disk, deciduous, generally imbricate. *Stamens* numerous, perigynous, rarely 1 or 5 or 10, in one or many series, sometimes connate and declinate; filaments subulate or filiform, usually incurved in bud; anthers small, didymous; dehiscence longitudinal, introrse. *Carpels* 1 or more, free or connate; styles basal, lateral, or subterminal, free or connate; stigmas simple or capitate or penicillate; ovules 1 or more in each carpel, anatropous, pendulous with a ventral, or ascending with a dorsal raphe. *Fruit* usually indehiscent, of clustered achenes or drupes, or a berry, or single drupe, rarely capsular dehiscent. *Seeds* erect or pendulous; testa membranous or coriaceous; albumen 0; embryo with large, flat, fleshy cotyledons.

Ovary superior; the ripe carpels not enclosed in the calyx-tube:—
  Carpel solitary; unarmed shrubs or trees............................**Pygeum.**
  Carpels many:—
    Unarmed herbs; ripe carpels dry; ovules solitary, ascending:—
      Achenes set on a fleshy receptacle ....**Fragaria.**
      Achenes set on a dry receptacle ....**Potentilla.**
    Armed shrubs; ripe carpels fleshy; ovules 2, pendulous......**Rubus.**
Ovary inferior; the ripe carpels enclosed in the calyx-tube:—
  Armed shrubs, with compound leaves and large adnate stipules; carpels many, not confluent when ripe................................**Rosa.**
  Unarmed trees, with simple leaves and small stipules; carpels few, confluent when ripe:—
    Ovary 5-celled; flowers panicled ....**Eriobotrya.**
    Ovary 2–3-celled; flowers corymbose ....**Pourthiæa.**

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306. **Pygeum** Gaertn.

Evergreen shrubs or trees; *leaves* alternate, persistent, usually entire; stipules small, fugacious; basal glands 2 or 0. *Flowers* small, racemose, sometimes ♂ from suppression of ovary. *Sepals* connate in a campanulate or urceolate tube, with limb 5–6-, or 10–15-lobed; lobes often unequal. *Petals* 5–6, minute when calyx 5–6-lobed, absent when calyx 10–15-lobed; even when present often much resembling calyx-lobes, usually villous. *Stamens* 10–50, 1- or more-seriate at mouth of calyx-tube; filaments slender, incurved; anthers small. *Carpel* solitary at the base of the calyx-tube, ovoid or subglobose; style terminal, slender, exserted; stigma terminal, capitate; ovules 2, collateral, pendulous. *Fruit* a transversely oblong, obscurely didymous, rarely subglobose drupe; pericarp thin, soft or dry. *Seeds* transversely oblong; cotyledons thick, hemispheric; radicle minute, superior.

Tree; leaves oblong-lanceolate, long-acuminate; racemes slender, villous; petals villous, narrow-ovate; stamens 30–40 .... *acuminatum.*
Shrub; leaves oblong, subacute or obtuse; racemes dense, glabrous; petals glabrous except margins, wide-ovate; stamens 15 .... *lucidum.*

731. Pygeum acuminatum Colebr.; F. B. I. ii. 318.
N. Bengal; Chittagong.
A tree; drupe dark-purple, an inch across.

732. Pygeum lucidum And. *P. Andersoni* F. B. I. ii. 320.
Chota Nagpur, Parasnath.
A shrub.

307. **Fragaria** Linn.

Perennial, scapigerous herbs with creeping stolons; *leaves* digitately 3-foliolate, rarely 5-foliolate, more rarely pinnate or simple; stipules adnate. *Flowers* white or yellow, often polygamous, cymose on erect scapes; bracteoles 5, close under calyx. *Sepals* 5, connate in a persistent, obconic or turbinate, disk-lined calyx; lobes valvate in bud. *Petals* 5. *Stamens* many, 1-seriate, persistent; filaments filiform, glabrous; anthers didymous. *Carpels* numerous on a convex receptacle; style ventral, persistent; ovule solitary, ascending. *Fruit* a large, fleshy receptacle, studded with many minute achenes sunk in its surface. *Seeds* minute.

Flowers yellow; fruit insipid .... *indica.*
Flowers white; fruit edible .... *vesca.*

733. FRAGARIA INDICA Andr. ; F. I. ii. 520 ; F. B. I. ii. 343 ; E. D. F. 678.
Tippera.
A herb with long, slender, prostrate stems.

734. FRAGARIA VESCA Linn. ; F. B. I. ii. 344 ; E. D. F. 682.
Cultivated in the cold season in the western provinces.
A herb with slender, prostrate stems. Strawberry.

308. **Potentilla** Linn.

Perennial herbs, rarely shrubs ; *leaves* digitately or pinnately compound ; stipules adnate. *Flowers* white or yellow, rarely red, solitary or in corymbose cymes ; bracteoles 5, rarely 4 under the calyx. *Sepals* 5, rarely 4, persistent, connate in a hemispheric or urceolate tube ; lobes valvate. *Petals* 5 or 4. *Disk* annular or lining the calyx-tube. *Stamens* many, 1- or more-seriate, rarely definite. *Carpels* many ; style persistent or deciduous, ventral or terminal ; ovule solitary, pendulous. *Fruit* of many achenes, clustered on a small, dry receptacle. *Seeds* minute.

735. POTENTILLA SUPINA Linn. ; F. B. I. ii. 359 ; E. D. P. 1210.
Comarum flavum F. I. ii. 521.
Tirhut ; N. Bengal.
An annual herb with numerous, slender, spreading stems.

309. **Rubus** Linn.

Sarmentose or erect shrubs, rarely creeping herbs, almost always prickly ; *leaves* alternate, simple or compound ; stipules adnate or free. *Flowers* in terminal and axillary corymbose cymes, rarely solitary, white or red ; bracteoles 0 under the calyx. *Sepals* 5, connate in a wide, short-tubed, disk-lined calyx ; lobes persistent. *Petals* 5. *Stamens* many. *Carpels* many or few, on a convex or conical receptacle ; style subterminal ; ovules 2, collateral, pendulous. *Fruit* usually a cluster of numerous, small, 1-seeded drupes, crowded on a dry or spongy conical or cylindric receptacle ; rarely drupes few, very rarely solitary. *Seed* pendulous.

736. RUBUS HEXAGYNUS Roxb. ; F. I. ii. 516 ; F. B. I. ii. 327.
Chittagong.
A climbing shrub, stems as thick as human arm, prickles rather flat ; flowers in large panicles. *Vernac.* Hirachura.

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310. **Rosa** Linn.

Shrubs, erect, sarmentose, or climbing, usually prickly; *leaves* pinnately 3- or more-foliolate; leaflets more or less serrate; stipules adnate. *Flowers* terminal, solitary or corymbose, white, yellow, or red; bracts rarely persistent. *Sepals* 5, connate in a persistent, globose, ovoid, or flask-shaped tube with contracted mouth; lobes leafy, persistent or deciduous, imbricate. *Petals* normally 5, in cultivation often many. *Disk* lining and almost occluding the calyx-tube, silky. *Stamens* many, inserted on the disk. *Carpels* many, rarely few, in the bottom of the calyx-tube; styles subterminal, free or connate upwards; stigma thickened; ovule solitary, pendulous. *Fruit* a fleshy calyx-tube (rose-hip), enclosing a cluster of coriaceous or bony achenes. *Seeds* small.

Fruit and branchlets densely tomentose; flowers subsessile, white, single, strongly pear-scented, surrounded by large, pectinate, woolly bracts; prickles twin .... *involucrata.*

Fruit and branches without tomentum; flowers stalked, often double, not bracteate:—

- Prickles mixed with often glandular bristles; flowers delicately scented, rose or purple:—
  - Prickles unequal, the larger ones hooked:—
    - Bristles few; sepals reflexed in flower .... *damascena.*
    - Bristles many; leaves and calyx glandular-ciliate; flowers nodding .... *centifolia.*
  - Prickles equal, slender; flowers erect .... *gallica.*
- Prickles not mixed with bristles; flowers purple, rose, or white, strongly scented:—
  - Prickles equal; sepals reflexed in flower:—
    - Calyx-tube obovate.. *indica.*
    - Calyx-tube globular .... *indica* (*semperflorens*).
  - Prickles somewhat unequal.. *alba.*

737. Rosa involucrata Roxb.; F. I. ii. 513; F. B. I. ii. 365; E. D. R. 532.

Chota Nagpur; N. and E. Bengal.

A shrub, grows naturally in places usually submerged during the rainy season. Wild Rose of Bengal.

738. Rosa damascena Mill.; F. B. I. ii. 364; E. D. R. 508.

In gardens, frequent; cultivated for Attar.

A small, erect shrub. *Vernac.* Guláb.

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739. Rosa centifolia Linn.; F. I. ii. 513; F. B. I. ii. 364; E. D. R. 504.
In gardens.
A small, erect shrub. Cabbage Rose. *Vernac.* Guláb.

740. Rosa gallica Linn.; F. B. I. ii. 364; E. D. R. 526.
In gardens, occasionally.
A small, erect shrub.

741. Rosa indica Linn.; F. B. I. ii. 364; E. D. R. 531. *R. chinensis* F. I. ii. 513.
In gardens, frequent.
A small, spreading shrub. *Beng.* Kanta-guláb.

741/2. Var. semperflorens. *R. semperflorens* F. I. ii. 514.
In gardens.
A small, spreading shrub.

742. Rosa alba Linn.; F. B. I. ii. 364; E. D. R. 501. *R. glandulifera* F. I. ii. 514.
In gardens.
A subscandent shrub. *Beng.* Shwet guláb.

311. **Eriobotrya** Lindl.

Large or small trees; *leaves* entire or serrate, simple, thickly coriaceous; stipules narrow-lanceolate, or broad. *Flowers* white, in thyrsoid panicles. *Sepals* 5, connate in a turbinate, obconic, or clavate tube; lobes small, ovate, obtuse, persistent, spreading or erect. *Petals* 5, contorted or imbricate in bud, orbicular or obovate, often notched and oblique, margins sinuate; claw glabrous or villous. *Stamens* about 20, inserted on the calyx-limb; filaments subulate. *Carpels* connate in a 2–5-celled inferior ovary; styles 2–5, connate and woolly below; ovules 2 in each cell, basal, ascending. *Fruit* a succulent or dry berry, 2–5-, rarely 1-locular; endocarp membranous; chambers 1-, less often 2-seeded. *Seeds* erect; cotyledons thick.

Petals contorted in bud; styles 2; leaves glabrous, long-petioled, petioles glabrous; fruit ·75 in. long, ellipsoid; seeds 1–2 ....*bengalensis.*
Petals not contorted; styles 5; leaves softly tomentose beneath, short-petioled, petioles woolly; fruit 1·5 in. long, ovoid; seeds 3–4, rarely 5 *japonica.*

743. Eriobotrya bengalensis Hook. f.; F. B. I. ii. 371; E. D. E. 281. *Mespilus bengalensis* F. I. ii. 510.
Chittagong.
A large, stout tree.

744. ERIOBOTRYA JAPONICA Lindl.; F. B. I. ii. 372; E. D. E. 285.
Mespilus japonica F. I. ii. 510.
Cultivated.
A small tree. The Loquat.

312. Pourthiæa Dcne.

Shrubs or small trees, generally woolly when young; *leaves* simple, persistent, crenate; stipules minute, subulate. *Flowers* small, white, in few-flowered corymbs with ultimately warted branchlets. *Sepals* 5, connate in an obconic tube; lobes acute. *Petals* 5, contorted, obovate, oblique and notched; claw glabrous. *Stamens* 20; filaments slender. *Carpels* 2–3, connate in an inferior ovary; styles 2–3, connate more than half their length; stigma 2-fid, capitate; ovules 2 in each loculus, collateral, basal, ascending. *Fruit* a small, ovoid or globose berry; flesh granular; seeds 1 or 2; endocarp membranous. *Seeds* ellipsoid; cotyledons rather thick.

745. POURTHIÆA ARGUTA Dcne, var. HOOKERI Hook. f.; F. B. I. ii. 382.
N. Bengal, Western Duars.
A shrub.

Order XLVIII. SAXIFRAGACEÆ.

Trees, shrubs, or herbs. *Leaves* alternate with stipules adnate to petiole or 0, or opposite with stipules 0. *Flowers* hermaphrodite or polygamo-diœcious, regular. *Disk* swollen or cup-like, or sometimes reduced to intra-staminal glands. *Sepals* 4 or 5, united in a calyx with the tube usually more or less adnate to ovary, but sometimes almost or quite free; lobes imbricate or valvate. *Petals* 4 or 5, rarely 0, perigynous or epigynous, rarely subhypogynous, imbricate or valvate. *Stamens* inserted with and usually as many or twice as many as petals, occasionally numerous; filaments free, sometimes dilated and 2-lobed; anthers small, didymous; dehiscence longitudinal, lateral or introrse, rarely extrorse. *Carpels* usually 2, less often 3–5, united in a usually 2-locular, less often 3–5-locular ovary with axial placentas, sometimes in a 1-locular ovary with parietal placentas; styles as many as carpels, free or connate towards the top, stigmas capitate or lateral subcapitate; ovules numerous, anatropous, erect or pendulous. *Fruit* dehiscent, capsular, rarely follicular, or an indehiscent berry. *Seeds* many or few, rarely solitary; albumen fleshy, rarely scanty or 0; embryo usually minute, subcylindric.

313. **Vahlia** Thunb.

Annual or biennial, pubescent, often glandular, erect herbs; *leaves* opposite, entire; stipules 0. *Flowers* axillary, subsessile or pedicelled, often geminate, white. *Sepals* 5, connate in a hemispheric tube adnate to the ovary; lobes persistent, ovate or lanceolate, valvate. *Petals* 5, epigynous, obovate, shorter than calyx-lobes. *Stamens* 5, inserted on the margin of the epigynous disk; filaments subulate. *Carpels* 2, connate in an inferior 1-celled ovary, with 2 pendulous, many-ovuled placentas; styles 2, stigmas capitellate. *Fruit* a capsule, dehiscing at the apex between the styles. *Seeds* many, minute, ellipsoid, smooth.

Flowers subsessile, 2- or often 1-flowered in most of the upper axils; filaments with a small hairy scale at their base........................*viscosa*.
Flowers peduncled, 2-, rarely 1-flowered in most of the upper axils; filaments naked at the base.....................................*oldenlandioides*.

746. VAHLIA VISCOSA Roxb.; F. I. ii. 89; F. B. I. ii. 399.
W. Bengal.
A small herb.

747. VAHLIA OLDENLANDIOIDES Roxb.; F. I. ii. 89; F. B. I. ii. 399.
Behar.
A small herb.

Order XLIX. CRASSULACEÆ.

Herbs, with often a woody rhizome, or undershrubs; stems and leaves usually succulent. *Leaves* alternate or opposite, usually simple; stipules 0. *Flowers* regular, hermaphrodite or 1-sexual, usually in cymes, sometimes subspicate or paniculate. *Disk* represented by hypogynous scales opposite, sometimes adnate to each carpel. *Sepals* connate in a 4–5-, more rarely 6–8-fid, free calyx. *Petals* 4–5, rarely 6–8, free or connate. *Stamens* as many or twice as many as petals, hypogynous or epipetalous; filaments filiform or subulate; anthers linear or didymous; dehiscence longitudinal, lateral. *Carpels* 4–5, very rarely fewer, free or connate below, narrowed upwards into the subulate or filiform free styles; stigmas often oblique, subcapitate, or minute; ovules numerous, 2–many-seriate on the ventral suture, rarely few, very rarely solitary, erect, or pendulous. *Fruit* of usually 4–5, rarely fewer, follicles dehiscing by the ventral suture. *Seeds* many, less often few, rarely solitary; albumen fleshy; embryo minute, cylindric.

Calyx with a long, inflated tube and a shortly 4-fid limb; corolla-tube campanulate with a shortly 4-fid limb; retiring angles of crenate leaves readily bulbiferous ....**Bryophyllum.**

Calyx with a short tube and deeply 4-partite limb; corolla-tube flask-like with a spreading 4-fid limb..**Kalanchoe.**

314. **Bryophyllum** Salisb.

Tall, erect, perennial, fleshy herbs; *leaves* opposite, crenate. *Flowers* large, drooping, in spreading panicles with opposite branches. *Sepals* 4, connate in an inflated, cylindric, or 4-angled calyx; lobes short, valvate. *Petals* 4, connate in a campanulate tube, with shortly lobed, patent limb. *Stamens* 8, 2-seriate, inserted in the middle of the corolla-tube; filaments filiform; anthers oblong, shortly exserted; hypogynous scales 4, obtuse. *Carpels* 4, free or connate at the base, narrowed into long, exserted styles; stigmas capitellate; ovules many. *Fruit* of 4 many-seeded follicles.

748. BRYOPHYLLUM CALYCINUM Salisb.; F. B. I. ii. 413; E. D. B. 909. *Cotyledon rhizophylla* F. I. ii. 456.

C. Bengal; Chittagong.

A glabrous, fleshy herb; stems 1–4 feet high. *Beng.* Kóp-pátá.

315. **Kalanchoe** Adans.

Erect, perennial herbs, with stout, fleshy stems and leaves; *leaves* opposite, or the upper alternate. *Flowers* large, erect, in many-flowered, subpaniculate cymes. *Sepals* 4, connate in a tubular calyx; lobes narrow, usually much longer than the tube. *Petals* 4, connate in an urceolate tube, with spreading lobes, persistent, much longer than calyx. *Stamens* 8, 2-seriate, adnate to corolla-tube, those of one series sometimes infertile or obsolete; hypogynous scales 4, linear or oblong. *Carpels* 4, adnate to base of corolla-tube, narrowed into exserted styles; stigmas obliquely

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truncate. *Fruit* of 4 many-seeded follicles. *Seeds* oblong, ellipsoid, longitudinally ribbed.

Leaves obovate-elliptic, crenate; sepals oblong, acute, standing apart at base ....*heterophylla.*
Leaves pinnatifid, laciniate, lobes entire, subserrate or dentate; sepals lanceolate, subpatent ....*laciniata.*

749. KALANCHOE HETEROPHYLLA Prain. *K. floribunda* var. *glabra* F. B. I. ii. 415. *Cotyledon heterophylla* F. I. ii. 456.
Chota Nagpur, Parasnath.
A stout, fleshy herb.

750. KALANCHOE LACINIATA DC.; F. B. I. ii. 415; E. D. K. 14. *Cotyledon laciniata* F. I. ii. 456.
Behar; E. Bengal.
A stout, fleshy herb. *Vernac.* Hemságar.

Order L. DROSERACEÆ.

Herbs, rarely somewhat woody below, perennial, usually small, generally glandular-hairy, and insectivorous. *Leaves* often rosulate, entire, rarely 2-fid or pinnatifid; stipules 2. *Flowers* hermaphrodite, regular. *Disk* 0. *Sepals* connate in a 4–5-, rarely 8-partite calyx, or free, imbricate, persistent. *Petals* 5, hypogynous, rarely perigynous, usually membranous, marcescent, free or connate below, imbricate. *Stamens* 4–20, hypogynous or perigynous, rarely epipetalous; filaments free or occasionally connate below, subulate or filiform; anthers basifixed or versatile; dehiscence completely or partially longitudinal, extrorse. *Ovary* free or only adnate to calyx at the base, globose or ovoid, 1–3-locular; styles 3–5; stigmas capitate, 2-fid, or fimbriate; ovules numerous, rarely few, attached to parietal, axial, or basal placentas, rarely pendulous, anatropous. *Fruit* a membranous or submembranous, usually loculicidal, 3–5-valved capsule. *Seeds* numerous, rarely few or solitary, in each loculus; albumen fleshy; embryo axial, cylindric, or basal, minute.

Leaves glandular, hairy, those of stem, if present, alternate ...**Drosera.**
Leaves vesicular, glabrous, those of stem opposite ....**Aldrovanda.**

316. Drosera Linn.

Perennial, glandular, pilose herbs, the glandular hairs partly derived from tissues beneath the epidermis; *leaves* rosulate, basal,

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the stem scapigerous, or alternate, the stem leafy, in bud usually circinate; stipules 0, or scarious and adnate. *Sepals* 4, 5, or 8, suberect, very slightly connate at base, free from ovary, persistent. *Petals* 4, 5, or 8, hypogynous or slightly perigynous, rose or white, marcescent. *Stamens* 4, 5, or 8, hypogynous or slightly perigynous. *Carpels* 2–5, connate in a 1-celled ovary with 2–5 styles; placentas parietal; ovules numerous. *Fruit* a loculicidally opening, 2–5-valved capsule. *Seeds* many, obovoid, ellipsoid.

Stem leafless; leaves all radical, rosulate, cuneate-spathulate; styles 5, undivided .... *Burmanni.*
Stems leafy, decumbent; leaves alternate, long, linear; styles 3, bifid to their base .... *indica.*

751. DROSERA BURMANNI Vahl.; F. I. ii. 113; F. B. I. ii. 424; E. D. D. 836.
In all the provinces except C. Bengal.
A small herb. *Hind.* Mukha-jali.

752. DROSERA INDICA Linn.; F. I. ii. 113; F. B. I. ii. 424.
Chota Nagpur.
A herb.

317. Aldrovanda Linn.

A weak, succulent, glabrous, floating, aquatic herb, with articulate stems; *leaves* spathulate, orbicular, whorled at the nodes, the blades contorted, bladder-like. *Flowers* peduncled, axillary, solitary; peduncles decurved in fruit; bracts 0. *Sepals* 5, slightly connate below, oblong, obtuse, imbricate. *Petals* 5, hypogynous, connivent in a cap. *Stamens* 5, hypogynous; filaments subulate; anthers didymous; dehiscence lateral. *Carpels* 5, connate in a 1-celled ovary, with 5 parietal placentas; styles 5, filiform, free, with terminal branching stigmas; ovules very many. *Fruit* a globose, 5-valved, membranous capsule. *Seeds* numerous, broad, oblong, with black, shining testa.

753. ALDROVANDA VESICULOSA Linn.; F. B. I. ii. 425. *A. verticillata* F. I. ii. 112.
C. Bengal, salt lakes.
A floating water-weed. *Beng.* Malacca jhangi.

Order LI. HALORAGEÆ.

Herbs or undershrubs, rarely annual, often aquatic. *Leaves* opposite or whorled, sometimes partly alternate, the submerged leaves often pectinate; stipules 0. *Flowers* hermaphrodite or 1-sexual, small, sometimes incomplete, usually axillary, solitary or fascicled, usually sessile; whorls sometimes spicately aggregated. *Disk* 0. *Sepals* connate in a calyx, with tube adnate to ovary; lobes 2, 4, or 0, or imperfect in ♂ flowers. *Petals* 2, 4, or 0, concave, deciduous, valvate or slightly imbricate, epigynous. *Stamens* 2–8 or 1, epigynous in the hermaphrodite flowers; anthers 2-locular; dehiscence longitudinal, lateral. *Ovary* inferior, 4-, or 2-, or 1-locular, compressed or angled; styles 4, 2, or 1, fimbriate or simple; ovules 4, 2, or 1, pendulous from apex of loculus. *Fruit* small, dry or drupaceous, 4-, 2-, or 1-celled, indehiscent or separating into indehiscent 1-seeded cocci. *Seeds* pendulous; testa membranous; albumen fleshy; embryo axial, cylindric.

318. **Myriophyllum** Linn.

Glabrous aquatic herbs with floating stems; *leaves* whorled, rarely alternate, dentate, serrate, or the submerged ones pectinate, pinnatifid, rarely entire. *Flowers* small, sessile, or subsessile, axillary in upper leaves or in nearly naked terminal spikes; monœcious or hermaphrodite. ♂ *Sepals* connate in a short tube; limb 4-, rarely 2-lobed, sometimes obsolete. *Petals* 2 or 4, concave, sessile. *Stamens* 2, 4, or 8 (in our species always 4). ♀ *Sepals* 4, connate in 4-furrowed tube; limb 0 or of 4 minute lobes. *Petals* minute or 0. *Carpels* 4, rarely 2, connate in an inferior 4-, rarely 2-celled ovary; styles 4, rarely 2, short, usually recurved and plumose; ovules solitary, pendulous in each chamber. *Fruit* a 4-furrowed nut or drupe, sometimes separating into 4, rarely 2 cocci. *Seeds* pendulous, cylindric-oblong; testa membranous; embryo cylindric, central in the copious albumen.

Flowers pink; stigmas pink, much fimbriate; fruits acutely ridged along carpel backs, both ridges and furrows beset by pointed tubercles
tuberculatum.

Flowers white; stigmas green, little fimbriate; fruits with rounded ridges along carpel backs, puberulous or glabrous, tubercled or not
indicum.

754. MYRIOPHYLLUM TUBERCULATUM Roxb.; F. I. i. 451; F. B. I. ii. 432.

C. and E. Bengal, in jheels.

A submerged water plant.

755. MYRIOPHYLLUM INDICUM Willd.; F. B. I. ii. 433. *M. tetrandrum* F. I. i. 451.

In all the provinces, in jheels and ponds.

A submerged water plant.

Order LII. RHIZOPHOREÆ.

Trees or shrubs. *Leaves* coriaceous, entire rarely serrulate, opposite, with stipules interpetiolar, caducous; rarely alternate, with stipules 0. *Flowers* regular, usually hermaphrodite, axillary, surrounded at the base by connate or cupular bracts, rarely ebracteate. *Sepals* connate in a calyx, almost always more or less adnate to the ovary; lobes 4–14, valvate, persistent. *Petals* as many as the calyx-lobes, entire, emarginate, 2-fid or lacerate, convolute or inflexed, always shorter than calyx-lobes. *Stamens* usually twice as many as petals, in antipetalous pairs embraced by the lamina, rarely numerous; filaments short or long, slender; anthers 2-celled with dehiscence longitudinal, lateral, rarely many-locellate. *Ovary* inferior, half-inferior or rarely superior, 2–5-locular, rarely by absorption of septa 1-locular; style usually simple, filiform; stigma simple or lobed, usually persistent; ovules in each loculus usually 2, pendulous. *Fruit* leathery, usually indehiscent, 1-celled, 1-seeded. *Seed* pendulous, arillate or not; albumen fleshy or 0; embryo in albuminous seeds minute, in exalbuminous elongated, often germinating while the fruit is still on the tree.

*Sea-shore trees (mangroves); seeds without albumen; embryo with a large radicle germinating while the fruit is still on the tree:—[p. 475]
  †Calyx-segments and petals not more than six; calyx surrounded by connate bracteoles:—[p. 475]
    Calyx-segments and petals each 4; petals entire; stamens 8; ovary 2-celled .... **Rhizophora.**
    Calyx-segments and petals each 5–6; petals not entire:—
      Petals emarginate; stamens 10–12; ovary 3-celled......... **Ceriops.**
      Petals lacerate; stamens indefinite; ovary 1-celled...... **Kandelia.**

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†Calyx-segments and petals 8–14; calyx without bracteoles; petals 2-fid; stamens 16–28; ovary 2–4-celled [p. 474] ....**Bruguiera.**

*Inland trees; seeds albuminous; embryo not germinating till fruit falls; calyx-tube minutely bracteolate [p. 474] ....**Carallia.**

319. **Rhizophora** Linn.

Littoral trees; branches marked by leaf-scars; *leaves* opposite, coriaceous, glabrous, mucronate; stipules large, interpetiolar, caducous. *Flowers* rather large, in axillary, 2–3-chotomously divided, few-flowered cymes; bracteoles connate round base of calyx. *Sepals* 4, connate in a short tube, adnate to ovary; lobes coriaceous, valvate. *Petals* 4, entire, inserted on a fleshy disk. *Stamens* 8, inserted with the petals; filaments short; anthers linear. *Carpels* 2, connate in a half-superior ovary, projecting beyond the calyx as a fleshy cone; chambers 2-ovuled; stigma 2-fid. *Fruit* 1-celled, 1-seeded, indehiscent, coriaceous, ovoid or obconic, with the reflexed, persistent calyx-teeth surrounding its base. *Seed* pendulous, germinating on the tree; radicle elongated, perforating the apex of the fruit.

Leaves elliptic; cymes longer than the petioles, from axils of present leaves, usually 3-flowered; flowers pedicelled; petals fleshy, lanate in front ....*mucronata.*

Leaves oblong to oblong-lanceolate; cymes shorter than the petioles, from axils of fallen leaves, usually 2-flowered; flowers sessile; petals thin, glabrous ....*conjugata.*

756. RHIZOPHORA MUCRONATA Lamk; F. B. I. ii. 435; E. D. R. 242. *R. Mangle* F. I. ii. 459.
Sundribuns; coasts of Orissa and Chittagong.
A small evergreen tree. *Beng.* Khamo, bhora; *Uriya* Rái.

757. RHIZOPHORA CONJUGATA Linn.; F. B. I. ii. 436.
Sundribuns.
A small tree. *Beng.* Khamo, bhora.

320. **Ceriops** Arn.

Shrubs; branches thick; *leaves* opposite, ovate or obovate; stipules interpetiolar, caducous. *Flowers* in condensed, 2–3-chotomous, axillary cymes; bracteoles connate round base of calyx. *Sepals* 5 or 6, connate in a short tube, adnate to ovary;

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lobes coriaceous, valvate. *Petals* 5–6, emarginate. *Stamens* 10 or 12, inserted between the lobes of a fleshy disk in pairs opposite the petals; anthers oblong or linear. *Carpels* 3, connate in an at least partially 3-celled ovary, produced above the calyx-limb as a fleshy cone; ovules in each carpel 2, pendulous; style simple, short, base conic; stigma simple. *Fruit* 1-celled, 1-seeded, indehiscent, coriaceous, obovoid, with the reflexed, persistent calyx-teeth surrounding its base. *Seed* pendulous, germinating on the tree; radicle elongated, perforating the apex of the fruit.

758. Ceriops Roxburghiana Arn.; F. B. I. ii. 436; E. D. C. 972.

Sundribuns.

A large shrub. *Beng.* Gorán.

321. **Kandelia** W. & A.

Small trees; branches terete; *leaves* opposite, coriaceous, oblong, obtuse; stipules interpetiolar, caducous. *Flowers* few, in axillary, dichotomous cymes; bracteoles connate round base of calyx. *Sepals* 5–6, connate in a short tube, adnate to ovary; lobes linear-lanceolate, valvate. *Petals* 5 or 6, bifid, with incised, multifid, capillary lobes. *Stamens* many; filaments slender, exserted; anthers small, oblong. *Carpels* 3, connate in a 1-locular, half-superior ovary, produced beyond the calyx in a fleshy cone; ovules 6, arising in pairs from a central column; style slender, with conic base; stigma 3-lobed. *Fruit* 1-celled, 1-seeded, indehiscent, coriaceous, ovoid, with the persistent calyx-teeth surrounding its base. *Seed* pendulous, germinating on the tree; radicle elongated, perforating the apex of the fruit.

759. Kandelia Rheedei W. & A.; F. B. I. ii. 437; E. D. K. 21.

Sundribuns.

A small tree. *Beng.* Goria; *Uriya* Rasunia.

322. **Bruguiera** Lamk.

Trees or shrubs; branches terete; *leaves* opposite, coriaceous, petioled, oblong, entire; stipules interpetiolar, caducous. *Flowers* rather large, solitary or cymose on axillary peduncles; bracteoles 0. *Sepals* 8–14, connate in an obconic or campanulate calyx, adnate to ovary; lobes lanceolate, valvate. *Petals* 8–14, oblong, 2-lobed or emarginate, convolute at base, appendiculate. *Stamens* 16–28, in pairs opposite the involving petals; filaments filiform;

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anthers linear, mucronate, as long as the filaments. *Carpels* 2–4, connate in a 2–4-celled inferior ovary; ovules 2 in each cell, geminate on the axis; style filiform, its base conic; stigma minutely 2–4-lobed. *Fruit* 1-celled, 1-seeded, indehiscent, coriaceous, turbinate. *Seed* pendulous, germinating on the tree; radicle elongated, perforating the apex of the fruit.

760. Bruguiera gymnorhiza Lamk; F. B. I. ii. 437; E. D. B. 898. *Rhizophora gymnorhiza* F. I. ii. 460.
Sundribuns; coasts of Orissa and Chittagong.
A large tree. *Beng.* Kankra.

323. **Carallia** Roxb.

Trees or shrubs; branches terete; *leaves* opposite, petioled, ovate or elliptic, entire or serrulate; stipules interpetiolar, caducous. *Flowers* small, sessile, usually crowded in short, peduncled, axillary, 3-chotomous cymes; bracteoles at base of calyx minute. *Sepals* 5–8, connate in a cylindric or campanulate tube above the ovary; lobes erect, short, valvate. *Petals* 5–8, inserted on a crenulated disk lining the calyx-tube, clawed, orbicular; entire, or 2-fid toothed or lacerate at the apex. *Stamens* 10–16, inserted with the petals; filaments filiform; anthers small, oblong. *Carpels* 3–5, connate in a 1-celled or a 3–5-celled ovary, slightly conically produced beyond the calyx; ovules 2 to each cell, attached axially in pairs above the middle; style subulate or filiform; stigma 3–5-lobed. *Fruit* usually 1-celled, 1-seeded, slightly produced beyond the calyx, globose, coriaceous, indehiscent. *Seed* subreniform, with fibrous testa; albumen fleshy; embryo curved.

761. Carallia lucida Roxb. *C. integerrima* F. B. I. ii. 439; E. D. C. 474.
E. Bengal; Chittagong.
An evergreen tree with shining leaves. *Beng.* Kierpa; *Kol.* Júr.

Order LIII. COMBRETACEÆ.

Trees or shrubs, often climbing. *Leaves* opposite, subopposite, or alternate, sometimes whorled, simple, rarely 3-foliolate; stipules 0. *Flowers* hermaphrodite or sometimes polygamo-diœcious or 1-sexual, spicate or racemose rarely cymose, bracteolate. *Disk* lobed or epigynous or 0. *Sepals* connate in a 4–5-, rarely 6–7-lobed calyx, with usually valvate, persistent, and occasionally accrescent or deciduous lobes; tube adnate to and produced, sometimes very far, above the ovary. *Petals* 4–5 or 0, rarely 6–7, usually small. *Stamens* 1-seriate, 4–5, or 2-seriate, 8–10, rarely indefinite, inserted on the limb or in the base of the calyx; filaments subulate or filiform, naked or rarely glandular, and occasionally alternating with staminodes; anthers versatile, didymous dehiscence longitudinal, lateral; rarely adnate with dehiscence by valves. *Ovary* quite inferior, 1-locular; style simple; stigma rarely sublobate; ovules usually 2–3, occasionally 4–7, rarely solitary, pendulous from the apex. *Fruit* usually indehiscent, leathery or drupaceous, ovate or angular or winged, sometimes crowned by the accrescent calyx-limb. *Seed* solitary; albumen 0; embryo with convolute or flattened cotyledons.

Inflorescence indefinite, in racemes, spikes, or heads; calyx-lobes valvate; stamens without glands or staminodes at their bases; anthers opening by longitudinal slits; ovules 2–7, suspended by a long funicle:—
  Petals 0:—
    Calyx-limb accrescent in fruit; diffuse rambling shrubs **Calycopteris.**
    Calyx-limb deciduous; erect trees or shrubs:—
      Flowers in heads ....**Anogeissus.**
      Flowers in spikes or racemes..............................**Terminalia.**
  Petals 5 or 4:—
    Calyx-limb deciduous; climbers with opposite leaves:—
      Calyx-tube not or shortly produced beyond ovary (never exceeding ·5 in. long); if produced, with calyx-limb 4-fid ......**Combretum.**
      Calyx-tube much produced beyond ovary (from ·75–2·5 in. long); calyx-limb 5-fid ....**Quisqualis.**
    Calyx-limb persistent; shrubs or trees (of mangrove-swamps) with alternate leaves ....**Lumnitzera.**
Inflorescence cymose; calyx-lobes imbricate; stamens with glands or staminodes at their base; anthers opening by recurved lateral valves; ovule solitary, suspended by a short funicle....................**Gyrocarpus.**

324. **Calycopteris** Lamk.

A diffuse shrub with drooping branches; *leaves* opposite, short-petioled, elliptic or ovate. *Flowers* small, in dense racemes, axillary and crowded in large panicles towards the ends of the

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branches; bracts lanceolate. *Sepals* 5, connate in a 5-striate calyx-tube, produced beyond the ovary; lobes persistent and accrescent. *Petals* 0. *Stamens* 10; 5 opposite the calyx-lobes and inserted on the tube, 5 alternate with and inserted between the calyx-lobes. *Carpel* solitary, inferior; style subulate, simple; ovules 3, pendulous from apex of cell. *Fruit* narrow, ovoid, 5-ribbed, villous, 1-seeded; surmounted by the enlarged calyx. *Seed* with convolute cotyledons.

762. CALYCOPTERIS FLORIBUNDA Lamk; F. B. I. ii. 449; E. D. C. 200. *Getonia floribunda* F. I. ii. 428.
Orissa; Chittagong.
A diffuse shrub with drooping branches.

325. **Anogeissus** Wall.

Trees or shrubs; *leaves* alternate or subopposite, petioled, entire. *Flowers* in dense globose heads on short axillary peduncles; bracteoles small or large. *Sepals* 5, connate in a tube, long-produced and slender beyond the ovary, subpersistent; lobes small, deciduous. *Petals* 0. *Stamens* 10, 2-seriate. *Carpel* solitary, inferior; ovules 2, pendulous from apex of cell; style filiform, simple. *Fruits* numerous, small, compressed, 2-winged, packed horizontally into dense heads. *Seed* solitary; cotyledons convolute.

Leaves broad, elliptic, obtuse at both ends, glabrous beneath ...*latifolia*.
Leaves acute at both ends, pubescent beneath :—
  Leaves elliptic or oblong; bracteoles obovate, often leaflike, large *acuminata*.
  Leaves narrow-lanceolate; bracteoles small, linear, very deciduous *lanceolata*.

763. ANOGEISSUS LATIFOLIA Wall.; F. B. I. ii. 450; E. D. C. 1149. *Conocarpus latifolia* F. I. ii. 442.
Orissa; Chota Nagpur; W. Bengal; Behar.
A tree. *Hind.* and *Uriya* Dohu; *Kol.* and *Santal.* Hesel.

764. ANOGEISSUS ACUMINATA Wall.; F. B. I. ii. 450; E. D. C. 1146. *Conocarpus acuminata* F. I. ii. 443.
Behar; Chota Nagpur.
A tree 60 feet high. *Beng.* Chakwa; *Uriya* Pansi; *Kol.* Gara hesel, parsia.

765. Anogeissus lanceolata Wall. *A. acuminata* var. *lanceolata* F. B. I. ii. 451; E. D. c. 1146.

Chittagong.

A tall tree.

326. **Terminalia** Linn.

Large trees; *leaves* alternate or subopposite, entire or slightly crenulate, often with glands on petiole or on the midrib beneath near the base. *Flowers* small, spicate, the spikes sometimes panicled, ☿ or the upper flowers of the spikes ♂ only; bracteoles narrow, soon deciduous. *Sepals* 5, connate in a campanulate calyx, produced slightly beyond the ovary; lobes of limb valvate, triangular, deciduous. *Petals* 0. *Stamens* 10, inserted on the calyx-tube, with a hairy, epigynous disk between them and ovary. *Carpel* solitary, inferior; ovules 2 or 3, pendulous from apex of cell; style long, simple. *Fruit* an ovoid, fleshy and stringy, or coriaceous drupe, with hard, indehiscent endocarp, externally smooth or with 2 or 5 angles or wings. *Seed* solitary; cotyledons convolute.

Fruit not winged, ovoid or subcompressed:—
  Leaves clustered towards ends of twigs, alternate; spikes always simple, axillary:—
    Petioles very short; base of obovate leaf narrow but cordate; fruit glabrous, ellipsoid, somewhat compressed, showing when dry two marked ridges .... *Catappa.*
    Petioles very long; base of broadly elliptic leaf cuneate; fruit tomentose, globular, when dry showing 5 faint ridges .... *belerica.*
  Leaves not clustered, usually more or less subopposite; spikes usually panicled; petioles distinct; fruit somewhat 5-ridged, at least when dry:—
    Leaves acute but not acuminate at apex, rounded at base; fruit ellipsoid or obovoid, ·75–1·25 in. long .... *Chebula.*
    Leaves acuminate at apex, cuneate at base; fruit oblong-lanceolate, 2 in. long, slightly 5-ridged, even when fresh .... *citrina.*
Fruit with 5 subequal acute wings; spikes paniculate; leaves opposite or subopposite:—
  Leaves short-petioled, at length glabrous beneath, oblong or elliptic in old trees, lanceolate in seedlings; wings of fruit marked with much ascending striations; bark pale, smooth, flaky .... *Arjuna.*
  Leaves distinctly petioled, usually persistently pubescent beneath, elliptic or ovate; wings of fruit marked with horizontal striations; bark dark-grey, rough, corrugated .... *tomentosa.*

766. Terminalia Catappa Linn.; F. I. ii. 430; F. B. I. ii. 444; E. D. T. 312.
Planted.
A large tree with horizontal branches and much-buttressed trunk. *Vernac.* Deshi-, bangla-, or hindi-badam. The Country Almond.

767. Terminalia belerica Roxb.; F. B. I. ii. 445; E. D. T. 293. *T. moluccana* F. I. ii. 432.
Chota Nagpur; W. Bengal; Chittagong.
A large tree. *Hind. Beng.* and *Uriya* Bhairá; *Santal* and *Kol.* Lopong. The Beleric Myrobalan.

768. Terminalia Chebula Retz; F. I. ii. 433; F. B. I. ii. 446; E. D. T. 325.
Chota Nagpur.
A large tree. *Beng.* Harítáki; *Hind.* and *Uriya* Harara; *Santal.* and *Kol.* Rol, rola. The Black Myrobalan.

769. Terminalia citrina Roxb.; F. I. ii. 435: F. B. I. ii. 446; E. D. T. 349.
W. N. and E. Bengal; Chittagong.
A tall tree. *Beng.* Harítáki, harra.

770. Terminalia Arjuna Bedd.; F. B. I. ii. 447; E. D. T. 282. *Pentaptera Arjuna* F. I. ii. 438.
Chota Nagpur; Behar; W. and N. Bengal.
A tall tree. *Vernac.* Arjhan.

771. Terminalia tomentosa Bedd.; F. B. I. ii. 447; E. D. T. 361. *Pentaptera tomentosa* F. I. ii. 440.
Chota Nagpur; Behar; W. Bengal.
A tall tree. *Vernac.* Asan, asna, saj; *Kol.* Hatana; *Santal.* Atnak'.

327. **Combretum** Linn.

Large or rarely small shrubs, usually with pendent or scandent branches, occasionally spinous, very rarely trees; *leaves* entire, petioled, opposite, sometimes ternate, occasionally alternate. *Flowers* small, polygamo-diœcious, spicate, spikes often panicled; bracteoles small. *Sepals* 5 or 4, connate in an urceolate calyx, produced slightly or considerably beyond the ovary; limb deciduous. *Petals* 5 or 4, very rarely 0. *Stamens* 10 or 8, 2-seriate, inserted with the petals on the calyx. *Carpel* solitary, inferior; ovules 2–5, pendulous from apex of cell; style subulate, simple.

Fruit dry, generally a drupe, occasionally opening, with 4 or 5 angles or ridges. *Seed* solitary; cotyledons plicate or flat, very rarely convolute.

Flowers with 5 calyx-lobes and 10 petals; floral leaves cream-white; fruit with 5 membranous wings ....*decandrum.*
Flowers with 4 calyx-lobes and 8 petals; leaves all green:—
Fruit with 4 thick, blunt ridges, not expanded into wings...*acuminatum.*
Fruit with 4 papery or membranous wings:—
Calyx very shortly produced, and not tubular beyond top of ovary:—
Surface of fruit between the wings more or less clothed with scales; calyx-tube beyond ovary funnel-shaped:—
Fruit densely clad with elongated, lanceolate-linear scales, and besides puberulous..*flagrocarpum.*
Fruit more or less clad with sessile, rounded scales, but otherwise glabrous:—
Scales on fruit close-set; leaves prominently covered with flat, round scales on both surfaces, glabrous when full grown *squamosum.*
Scales on fruit smaller, distant; leaves punctate on both sides, subscabrous above, pubescent on the nerves beneath *dasystachyum.*
Surface of fruit between the wings not scaly, glabrous or nearly so:—
Calyx-tube beyond the ovary funnel-shaped:—
A climbing shrub; leaves opposite or often ternate; racemes subequal, rather numerous; calyx outside and young ovary densely glandular and finely hairy ....*chinense.*
A small shrub with annual shoots from a woody stock; leaves alternate or opposite; racemes few, one much longer than the rest; calyx outside and young ovary sparsely glandular, glabrous ....*nanum.*
Calyx-tube beyond the ovary wide-campanulate......*ovalifolium.*
Calyx distinctly produced beyond the ovary as a cylindric tube, terminated by a campanulate 4-fid limb ....*extensum.*

772. COMBRETUM DECANDRUM Roxb.; F. I. ii. 232; F. B. I. ii. 452; E. D. C. 1742.

W. N. and E. Bengal; Chota Nagpur; Orissa; Chittagong.

A large shrub with subscandent branches. *Santal.* Aténa.

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773. COMBRETUM ACUMINATUM Roxb.; F. I. ii. 228; F. B. I. ii. 455.
N. Bengal; Chittagong.
A large scandent shrub. *Vernac.* Patyuni.

774. COMBRETUM FLAGROCARPUM Clarke; F. B. I. ii. 455.
N. and E. Bengal; Chittagong.
A large scandent shrub.

775. COMBRETUM SQUAMOSUM Roxb.; F. I. ii. 231; F. B. I. ii. 456.
Chittagong; N. and E. Bengal.
A large scandent shrub.

776. COMBRETUM DASYSTACHYUM Kurz; F. B. I. ii. 457.
Chittagong.
A scandent shrub.

777. COMBRETUM CHINENSE Roxb.; F. I. ii. 230; F. B. I. ii. 457.
Chittagong.
A large climbing shrub.

778. COMBRETUM NANUM Ham.; F. B. I. ii. 457; E. D. C. 1744.
Tirhut; Chota Nagpur.
A dwarf shrub, coming up annually after forest fires.

779. COMBRETUM OVALIFOLIUM Roxb.; F. I. ii. 226; F. B. I. ii. 458; E. D. C. 1746.
Chota Nagpur; Orissa.
A large climbing shrub.

780. COMBRETUM EXTENSUM Roxb.; F. I. ii. 229; F. B. I. ii. 458.
Chota Nagpur; Chittagong.
A large climbing shrub. *Vernac.* Cou-lata.

328. **Quisqualis** Linn.

Large, scandent or subscandent shrubs; *leaves* opposite, oblong or obovate, entire. *Flowers* in short axillary or terminal spikes, red or white; bracteoles small. *Sepals* 5, connate in an urceolate calyx with a narrow, slender tube produced far beyond the ovary and deciduous with the limb. *Petals* 5, small. *Stamens* 10, short. *Carpel* solitary, inferior; style filiform, subadnate to calyx-tube; stigma subcapitate; ovules 3–4, pendulous from apex of cell. *Fruit* a dry, coriaceous, 5-angled or 5-winged, subindehiscent drupe. *Seed* solitary; cotyledons not convolute.

781. QUISQUALIS INDICA Linn.; F. I. ii. 457; F. B. I. ii. 459; E. D. Q. 88.

In gardens everywhere.
A large climbing shrub.

329. Lumnitzera Willd.

Littoral shrubs or small trees; *leaves* clustered towards ends of branches, alternate, thickly coriaceous, narrow-obovate, subsessile, entire or subcrenate. *Flowers* small, in axillary or terminal racemes; bracteoles 2, adnate to base of calyx. *Sepals* 5, connate in an oblong calyx-tube, produced beyond ovary; lobes of limb persistent. *Petals* 5, oblong. *Stamens* 2-seriate, 10, or occasionally those of one series partly or wholly absent. *Carpel* solitary, inferior; ovules 2–5, pendulous from apex of cell; style simple, subulate. *Fruit* a woody, elliptic, oblong drupe, longitudinally striate or nearly smooth. *Seed* solitary; cotyledons convolute.

782. LUMNITZERA RACEMOSA Willd.; F. B. I. ii. 452; E. D. L. 576. *Petaloma alternifolia* F. I. ii. 372.

Sundribuns.
A small tree 20–40 feet high. *Beng.* Kripa.

330. Gyrocarpus Jacq.

A considerable tree; *leaves* alternate, long-petioled, large, entire or (in young plants) lobed, clustered towards ends of branches. *Flowers* small, 1-sexual, ♂ very many, ♀ few, with a very few hermaphrodite flowers sometimes intermixed, in large branched cymes; bracteoles 0. ♂ *Sepals* 4–7, united in a very short tube. *Petals* 0. *Stamens* 4–7, inserted at base of calyx with as many alternating clavate glands; anthers oblong, small; dehiscence valvular. *Ovary* 0. ♀ and ⚥ *Sepals* 4, connate in a short tube, adnate to ovary; lobes of limb in pairs, outer very small, deciduous, inner accresent in fruit. *Petals* 0. *Stamens* 0 or in ⚥ 4. *Carpel* solitary; ovule solitary, pendulous from the apex of the cell; stigma sessile. *Fruit* a bony nut, crowned by the elongated, spathulate inner calyx-lobes. *Seed* solitary; cotyledons convolute.

783. GYROCARPUS AMERICANUS Jacq. *G. Jacquini* F. I. i. 445; F. B. I. ii. 461; E. D. G. 780.

Orissa; S.-W. Bengal, near the sea.
A considerable tree; perhaps only planted in our area. *Vernac.* Zaitan.

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Order LIV. MYRTACEÆ.

Trees or shrubs, rarely herbs. *Leaves* opposite, rarely alternate or whorled, petioled, simple, entire, rarely dentate, 3-nerved or pinnately nerved, and usually with an intermarginal nerve, generally coriaceous and gland-dotted; stipules 0 or minute, fugacious. *Flowers* regular, rarely slightly irregular, hermaphrodite or sometimes polygamous, axillary, rarely subterminal, often 2-bracteolate. *Disk* lining the calyx-tube. *Sepals* connate in a superior or half-superior calyx; limb usually 4–5-, sometimes many-fid or -partite, persistent or deciduous, valvate or imbricate, occasionally entire or closed in bud. *Petals* 4–5, rarely 6, or fewer by abortion, or 0, equal, or the outer slightly larger, usually much imbricate. *Stamens* usually numerous, several-seriate, rarely definite and 2- or 1-seriate, and alternate with petals; filaments inserted with petals on the disk, free or somewhat connate at the base or connate in bundles opposite the petals; anthers subglobose, 2-celled; dehiscence longitudinal, lateral. *Ovary* half-inferior or inferior, crowned by the disk, 1-locular with 1 or more ovules, or 2–many-locular with numerous ovules; style terminal, rarely lateral, smooth or bearded at the top; stigma simple; ovules campylotropous or anatropous on usually axial placentas, rarely in 1-locular ovaries on 2 parietal placentas. *Fruit* usually tipped by the calyx-limb, occasionally half-superior, loculicidally dehiscent above by as many valves as there are cells, or dry, indehiscent, 1-seeded, or an indehiscent, fleshy berry with cells many-seeded or, by arrest, 1-seeded. *Seeds* angled, cylindric, or compressed; testa hard or membranous, sometimes winged; albumen 0; embryo straight, curved, or spirally twisted.

Fruit dehiscent, a loculicidally 3-valved capsule; leaves alternate, nerves several from base; bark peeling in spongy flakes; individual flowers sessile, in spikes or heads..**Melaleuca.**

Fruit not dehiscent; bark not flaky; flowers pedicelled, in racemes or cymes or solitary:—

  *Leaves opposite, usually gland-dotted; fruit berry-like:—[p. 486]

    Limb of calyx closed in bud; lobes subimbricated, rather deeply valvately separated when in flower; seeds numerous.........**Psidium.**

    Limb of calyx 4–5-lobed or -partite in bud, not further divided when in flower; seeds few:—

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Ovules pendulous from the top of the locules ....**Pimenta.**

Ovules from the whole inner angle or from a somewhat prominent septal placenta :—

Embryo with small seed-leaves ....**Myrtus.**

Embryo with large, fleshy seed-leaves ....**Eugenia.**

*Leaves alternate, not gland-dotted :—[p. 485]

Stamens partly imperfect (without anthers) ; fruit ovoid or spherical, fleshy ; seeds many...**Careya.**

Stamens all perfect ; fruit angular, fibrous ; seed solitary **Barringtonia.**

331. Melaleuca Linn.

Trees or shrubs ; *leaves* alternate, rarely opposite, entire, lanceolate or linear, flat or subterete, 1–3- or many-nerved. *Flowers* spicate or capitate, the heads or spikes sessile in the axil of a floral leaf ; bracts deciduous. *Sepals* 5, connate in a subglobose calyx-tube ; lobes imbricate or open. *Petals* 5, spreading, deciduous. *Stamens* many, more or less united at their bases into 5 bundles opposite the petals ; anthers versatile ; cells parallel, with dehiscence longitudinal. *Carpels* 3, connate in an inferior ovary, enclosed in the calyx-tube ; ovules usually many on a peltate placenta in each cell ; style filiform ; stigma small, usually capitate. *Fruit* a capsule opening loculicidally from the apex by 3 valves. *Seeds* wedge-shaped ; testa thin ; embryo straight.

784. MELALEUCA LEUCADENDRON Linn. ; F. I. iii. 397 ; F. B. I. ii. 465 ; E. D. M. 340.

C. Bengal, in parks and gardens.

A tall tree. *Vernac.* Cajaputi.

332. Psidium Linn.

Trees or shrubs ; *leaves* opposite, entire, not dotted. *Flowers* large, white ; peduncles solitary or few-flowered, axillary. *Sepals* 4 or 5, quite connate in bud in an urceolate or obovate calyx ; limb separating valvately in flower. *Petals* 4 or 5, free. *Stamens* many, inserted in several series on a wide disk ; anthers oblong, fixed near base ; dehiscence longitudinal. *Carpels* 2–7, usually 4 or 5, connate in an ovary with as many chambers ; ovules in each cell numerous ; style filiform, often thickish ; stigma peltate or capitate. *Fruit* a globose, ovoid, or pyriform berry, crowned by the calyx-limb or not. *Seeds* many or few, subreniform ; testa hard ; embryo curved, horseshoe-shaped or subspiral.

785. Psidium Guyava Linn.; F. B. I. ii. 468; E. D. P. 1343. *P. pyriferum* F. I. ii. 480. *P. pomiferum* F. I. ii. 480.
Naturalised and planted in all the provinces.
A small tree. *Hind.* Amrud; *Beng.* Piyar. The Guava.

333. Pimenta Lindl.

Fragrant trees; *leaves* large, coriaceous, dotted, opposite, penninerved. *Flowers* small, in many-flowered 3-chotomous cymes, in the upper axils. *Sepals* 4 or 5, connate in a small turbinate or campanulate tube, little if at all produced beyond the ovary; lobes of limb spreading, persistent. *Petals* 4 or 5, spreading. *Stamens* many, in several series, free; filaments filiform; anthers short, versatile, dehiscence longitudinal. *Carpels* 2, connate in a 2-celled ovary; ovules 1–4 in each cell, pendulous from near the top of the inner angle; style filiform; stigma small or subcapitate. *Fruit* a small berry crowned by the calyx-limb. *Seeds* few, globose or subreniform; testa membranous or hard; embryo more or less spiral, with a very long radicle and short cotyledons.

786. Pimenta officinalis Berg. *P. acris* F. B. I. ii. 462.
Occasionally planted in native gardens, especially in the eastern provinces.
A fragrant tree. The Allspice or Pimenta.

334. Myrtus Linn.

Shrubs, rarely trees; *leaves* opposite, penninerved, usually small. *Flowers* on axillary, generally slender peduncles, solitary or cymosely 3–7, less often numerous, the central with a short the lateral with longer pedicels; bracteoles under calyx sometimes large leafy, sometimes small. *Sepals* 4 or 5, connate in a turbinate tube, adnate to but hardly produced beyond ovary; lobes of limb imbricate or open. *Petals* 4 or 5, spreading. *Stamens* many, in several series; filaments free, filiform or flattened; anthers versatile or basifixed; dehiscence longitudinal. *Carpels* 2–3, rarely 4, connate in an ovary with as many perfect or partial cells, from the septa not always reaching the axis; placentas sometimes slender, sometimes 2-lamellate, with many ovules irregularly or 2-seriately arranged on the axis; style filiform; stigma small, rarely capitate. *Fruit* a berry, usually crowned by the calyx-limb, sometimes naked. *Seeds* 1–2 perfect, less often many, subreniform; testa hard or membranous; embryo horseshoe-shaped; radicle very long, cotyledons small or minute.

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787. MYRTUS COMMUNIS Linn.; F. I. ii. 497; F. B. I. ii. 462; E. D. M. 921.
In hedges: Behar; Tirhut.
A shrub. *Vernac.* Belati mehndi. Myrtle.

335. Eugenia Linn.

Trees or shrubs; glabrous or rarely pubescent; *leaves* opposite, rarely alternate, coriaceous or membranous, penninerved. *Flowers* solitary, axillary, or in short racemes (axillary leafless branches), or in dense terminal cymes, or in lateral or terminal 3-chotomous panicles; bracts usually small, deciduous. *Sepals* 4, rarely 5, connate in a globose or clavate calyx-tube; lobes of limb imbricate. *Petals* 4, rarely 5 or more, very rarely 0, free and spreading or connate in a cap. *Stamens* many, in several series, free or slightly connate in 4 bundles; filaments filiform; anthers small, versatile; dehiscence longitudinal. *Carpels* 2, rarely 3, connate in a 2-, rarely 3-celled ovary; ovules in each cell numerous; style filiform; stigma small. *Fruit* a drupaceous or dry and fibrous berry, crowned by the persistent calyx-lobes. *Seeds* few, globose or variously compressed; testa membranous or cartilaginous; embryo with a short, thick radicle; cotyledons connate or free.

*Calyx inside with a circular or quadrangular disk within or under the stamens; limb conspicuously 4-lobed, persistent; flowers large, showy; fruits large, ovoid or turbinate; seeds large, several, or if solitary with some abortive seeds; endocarp thick, fleshy :—[p. 489]
Leaves ternate; flowers with 8–16 petals, all lateral; calyx-lobes incurved in fruit...*polypetala.*
Leaves opposite; flowers with 4 petals :—
Leaves wide-based, stem-clasping; flowers all lateral; calyx-lobes incurved in fruit :—
Flowers purplish-red; fruit white ....*formosa.*
Flowers white; fruit greenish-yellow ....*amplexicaulis.*
Leaves narrowed to the base, tapering into the petiole, or if rounded not stem-clasping :—
Flowers all lateral, red; leaves tapering into petiole; calyx-lobes incurved in fruit ....*malaccensis.*
Flowers terminal as well as lateral, or terminal only :—
†Calyx-lobes incurved in fruit :—[p. 489]
‡Flowers sessile, in terminal and lateral compact cymes, rose-coloured or white; leaves rounded or subcordate at base [p. 489] ....*macrocarpa.*

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‡Flowers distinctly pedicelled :—[p. 488]

Leaves rounded or often cordate at base; flowers in terminal and axillary cymes, rose-purple or white; fruit pale-rose or white ....*aquea*.

Leaves tapering into petiole; flowers in terminal clusters only, always white; fruit dull yellow ....*Jambos*.

†Calyx-lobes spreading in fruit; flowers rather long-pedicelled, in axillary and terminal cymes [p. 488] ....*lanceæfolia*.

*Calyx inside smooth, with no disk inside or under the stamens; flowers small; calyx-limb usually obsolete or truncate after flowering; fruits small, globular oblong or pyriform; seeds 1–2; endocarp often pulpy :—[p. 488]

§Flowers in racemes or cymes; leaves, branchlets, and inflorescences glabrous :—[p. 490]

Calyx elongated, clavate; petals free; flowers in axillary racemes *claviflora*.

Calyx short, hemispherical; petals (except in *C. venusta*) falling off in one piece; flowers in cymes :—

Leaves bright-green, shining; lateral nerves slender, close and parallel, or nearly so :—

Cymes lateral, mostly at the scars of fallen leaves :—

Bark of twigs brown; branchlets of inflorescence sharply 4-angled; calyx subsessile; fruit the size of a pea...*fruticosa*.

Bark of twigs white; branchlets of inflorescence bluntly 4-angled; calyx-base narrowed and pedicellate :—

Leaves ovate or oblong :—

Fruits ovoid, as large as an olive ....*Jambolana*.

Fruits spherical, as large as a pea *Jambolana* var. *caryophyllifolia*.

Leaves narrowly lanceolate; fruit ovoid, half as large as an olive ....*Heyneana*.

Cymes terminal and axillary, or terminal only :—

Branchlets rounded, brown; fruit as large as a cherry...*oblata*.

Branchlets 4-angled, white; fruit the size of a pea; *petals free*..*venusta*.

Leaves dull-green, opaque; lateral main-nerves distant, with reticulate, finer venation between; cymes lateral :—

Cymes compact; calyx with a pedicel-like, narrow base, and a truncate limb; fruit small, globose, the size of a pea :—

Leaves ovate or ovate-lanceolate ....*balsamea*.

Leaves narrowly lanceolate ....*balsamea* var. *angustifolia*.

Cymes laxly panicled; calyx sessile, margin of limb obtusely lobed; fruit the size of a sloe :—

Fruit globose ; leaves not decurrent on the petiole :—
Leaves ovate ....*operculata*.
Leaves obovate ....*operculata* var. *obovata*.
Fruit ovoid ; leaves decurrent on the petiole
operculata var. *Paniala*.

§Flowers solitary or fascicled in leaf-axils ; leaves, branches, and inflorescences pubescent [p. 489] ....*bracteata*.

788. EUGENIA POLYPETALA Wall. ; F. B. I. ii. 472. *E. angustifolia* F. I. ii. 490.
Chittagong.
A small tree.

789. EUGENIA FORMOSA Wall. ; F. B. I. ii. 471 ; E. D. E. 409.
Chittagong.
A large tree. *Beng.* Phul-jamb.

790. EUGENIA AMPLEXICAULIS Roxb. ; F. I. ii. 483 ; F. B. I. ii. 471.
Chittagong.
A large tree.

791. EUGENIA MALACCENSIS Linn. ; F. I. ii. 483 ; F. B. I. ii. 471 ; E. D. E. 444.
Planted in E. and C. Bengal and in Chittagong.
A shrub or small tree. *Beng.* Malacca jamrul.

792. EUGENIA MACROCARPA Roxb. ; F. I. ii. 497 ; F. B. I. ii. 474.
Chittagong.
A small tree. *Beng.* Chalta-jamb.

793. EUGENIA AQUEA Burm. ; F. I. ii. 492 ; F. B. I. ii. 473 ; E D. E. 396.
Chittagong.
A medium-sized tree. *Beng.* Jambo.

794. EUGENIA JAMBOS Linn. ; F. I. ii. 494 ; F. B. I. ii. 474 ; E. D. E. 432.
N. and E. Bengal, cultivated ; perhaps wild in the Duars.
A medium-sized tree. *Beng.* Gulab-jamb.

795. EUGENIA LANCEÆFOLIA Roxb. ; F. I. ii. 494. *E. Wallichii* var. *lanceæfolia* F. B. I. ii. 475.
Chittagong.
A medium-sized tree. *Beng.* Poora-jamb.

796. EUGENIA CLAVIFLORA Roxb. ; F. I. ii. 488 ; F. B. I. ii. 484 ; E. D. E. 407.
Chittagong.
A tree. *Vernac.* Lamba-nali-jamb.

797. EUGENIA FRUTICOSA Roxb.; F. I. ii. 487; F. B. I. ii. 499.
E. Bengal; Chittagong.
A small tree. *Vernac.* Ban-jamb.

798. EUGENIA JAMBOLANA Lamk; F. I. ii. 484; F. B. I. ii. 499; E. D. E. 419.
Planted in all the provinces; sometimes semi-wild.
A medium-sized tree. *Hind.* Jaman; *Beng.* Kala-jamb, jamb; *Kol.* and *Santal.* Kudo; *Uriya* Jamo, jamkuli.

798/2. Var. CARYOPHYLLIFOLIA F. B. I. ii. 499; E. D. E. 428. *E. caryophyllifolia* F. I. ii. 486.
Orissa; Chota Nagpur.
A medium-sized tree. *Vernac.* Chota jamb.

799. EUGENIA HEYNEANA Wall.; F. B. I. ii. 500; E. D. E. 416.
Behar; Chota Nagpur.
A shrub in river-beds and nullahs. *Santal.* and *Kol.* Gara kudo.

800. EUGENIA OBLATA Roxb.; F. I. ii. 493; F. B. I. ii. 492; E. D. E. 450.
Chittagong.
A medium-sized tree. *Vernac.* Gulam.

801. EUGENIA VENUSTA Roxb.; F. I. ii. 491; F. B. I. ii. 488.
Tippera.
A small tree with drooping branches.

802. EUGENIA BALSAMEA Wight; F. B. I. ii. 499.
N. Bengal.
A small tree.

802/2. Var. ANGUSTIFOLIA F. B. I. ii. 499.
Chittagong.
A small tree.

803. EUGENIA OPERCULATA Roxb.; F. I. ii. 486; F. B. I. ii. 498; E. D. E. 453.
N. Bengal; E. Bengal; Chittagong.
A large tree. *Beng.* Boti-jamb; *Hind.* Rai-jamb; *Kol.* Topa; *Santal.* Totonopak'.

803/2. Var. OBOVATA F. B. I. ii. 498; E. D. E. 458.
Chota Nagpur; N. Bengal.
A large tree.

803/3. Var. PANIALA F. B. I. ii. 498. *E. Paniala* F. I. ii. 489; E. D. E. 460.
Chittagong.
A large tree. *Beng.* Paniala jamb.

804. Eugenia bracteata Roxb.; F. I. ii. 490; F. B. I. ii. 502.
Orissa.
A shrub. *Beng.* Hidjli menadi.

336. Careya Roxb.

Small undershrubs or large trees; *leaves* alternate, crowded towards the ends of branches, membranous, somewhat crenate-serrate, penninerved, not dotted, narrowed to the sessile or petioled base. *Flowers* large, showy, in racemes or interrupted spikes. *Sepals* 4, connate in a campanulate or funnel-shaped tube, hardly produced beyond ovary; lobes ovate, imbricate. *Petals* 4, imbricate. *Stamens* very many, many-seriate, connate at their base; filaments filiform, the outermost and innermost sterile. *Carpels* 4–5, connate in an inferior ovary with an annular, epigynous disk; ovules many, in two rows in each cell on vertical axial placentas; style long, simple; stigma filiform. *Fruit* a large, globose, fibrous berry, crowned by the persistent calyx-lobes; dissepiments subobsolete. *Seeds* many, ellipsoid, embedded in pulp; albumen 0; embryo large with obsolete cotyledons.

Undershrub with perennial woody rootstock, the shoots annual, springing up after forest fires..*herbacea.*
Tree 30–60 feet high ....*arborea.*

805. Careya herbacea Roxb.; F. I. ii. 638; F. B. I. ii. 510; E. D. C. 580.
N. Bengal.
An undershrub. *Beng.* Bhui dalim.

806. Careya arborea Roxb.; F. I. ii. 638; F. B. I. ii. 511; E. D. C. 563.
In all the provinces.
A tree. *Hind.* Kambi; *Santal.* Kambir; *Kol.* Asanda.

337. Barringtonia Forst.

Trees; *leaves* alternate, crowded towards ends of branches, entire or crenate-serrate, penninerved, not dotted. *Flowers* in elongated, terminal or lateral racemes or interrupted spikes; bracts small, deciduous. *Sepals* connate in a calyx-tube, scarcely produced beyond ovary; lobes of limb 3–5 imbricate, or 2–4 valvate. *Petals* 4, rarely 5, imbricate, adnate at base to staminal tube. *Stamens* very numerous, many-seriate, connate below;

filaments filiform, long, all fertile. *Carpels* 2–4, connate in a 2–4-celled inferior ovary, crowned by the annular epigynous disk; ovules 2–8 in each cell, pendulous; style long, simple; stigma small. *Fruit* a fibrous berry, crowned by the persistent calyx-limb, globose or quadrangular, by abortion 1-seeded. *Seed* ovoid or ellipsoid; albumen 0; embryo large; cotyledons subobsolete.

Calyx valvate; fruit ovoid, when ripe slightly 4-angled towards base *racemosa.*
Calyx slightly imbricate; fruit oblong, fusiform, markedly 4-angled throughout ....*acutangula.*

807. BARRINGTONIA RACEMOSA Bl.; F. I. ii. 634; F. B. I. ii. 507; E. D. B. 193.
Sundribuns.
A medium-sized tree. *Beng.* Samundra.

808. BARRINGTONIA ACUTANGULA Gaertn.; F. I. ii. 635; F. B. I. ii. 508; E. D. B. 180.
In all the provinces.
A small tree. *Hind.* Hidjal; *Beng.* Hidjal; *Uriya* Kinjol, hidjara.

Order LV. MELASTOMACEÆ.

Herbs or shrubs, sometimes climbing; rarely trees. *Leaves* opposite or rarely whorled, generally petioled, entire or nearly so, often palmately nerved from near the base; stipules 0. *Flowers* regular, hermaphrodite, spiked, panicled, or corymbed, rarely clustered or solitary. *Disk* occasionally present as a membranous or coriaceous extra-staminal corona. *Sepals* connate as a calyx with tube united by vertical walls to the ovary, sometimes nearly free; limb usually 4–5-, sometimes 3- or 6-lobed, occasionally truncate, rarely deciduous as a cap. *Petals* as many as lobes of calyx, inserted on margin of tube, contorted. *Stamens* 1-seriate, as many as or more than, often twice as many as petals; filaments bent inwards in bud, inserted with petals, often alternately shorter and longer, sometimes alternately perfect and rudimentary; anthers 2-locular, basifixed; connective often appendaged near the base by bristles or tubercles or a spur; dehiscence usually terminal porous, rarely by short, longitudinal, introrse slits. *Ovary* 4–5-, rarely 3- or 6-locular, very rarely 1-locular; style simple, filiform, rarely short; stigma punctiform or truncate or capitate, simple or lobed; ovules many, anatropous on axial or less often on parietal placentas, rarely few on a free, central placenta. *Fruit* included in the calyx-tube, capsular, dehiscent irregularly or by slits or valves at the top of its cells, or an indehiscent berry. *Seeds* minute, usually very many, rarely solitary; albumen 0; embryo with short, very rarely with long, convolute cotyledons.

Leaves 3- or more-nerved from base; ovary 4–5-celled; placentas radiating from axis; ovules and seeds very many; fruit more or less capsular:—
  Petals 4–5; seeds curved through half a circle, minutely punctate:—
    Stamens all alike..**Osbeckia.**
    Stamens very unequal..**Melastoma.**
  Petals 3; seeds straight, oblong or wedge-shaped, often angular **Sonerila.**
Leaves pinnately nerved; ovary 1-celled, placentas free, central; ovules usually 9; seeds solitary; fruit a berry ....**Memecylon.**

338. Osbeckia Linn.

Herbs or shrubs, usually erect; branches generally 4-angled; *leaves* opposite or occasionally ternate, entire, subcoriaceous, 3–7-nerved. *Flowers* terminal, solitary, capitate or panicled, purple or white; bracts usually conspicuous. *Sepals* 5 or 4, connate in an ovoid tube, beset with stellate hairs or pectinate scales; limb pubescent, with usually stellate, rarely simple hairs. *Petals* 5 or 4. *Stamens* 10 or 8, equal or subequal; anthers oblong, truncate or attenuate or beaked; connective not produced at the base, slightly swollen or 2-tuberculate. *Carpels* connate in an inferior, 5- or 4-celled ovary, more or less adnate to calyx-tube; ovules numerous, on placentas radiating from the axis; style long, simple. *Fruit* a capsule opening at its free apex by 5 or 4 pores. *Seeds* many, curved, minutely tuberculate.

*Perianth normally 4-merous:—[p. 495]
  Anthers not beaked; annual herbs:—
    Capsule oblong, distinctly 8-ribbed; plant 4–16 in. high ...*truncata.*
    Capsule ovoid, very faintly ribbed; plant 2 in. high *truncata* var. *Kurzii.*
  Anthers beaked:—
    †Flowers small; calyx-tube campanulate; a herb with drooping branches [p. 495] ....*chinensis.*

*Flowers large, showy; calyx-tube urceolate, in fruit produced beyond apex of ovary into a tubular neck; shrubs:—[p. 494]

Branches many, spreading, densely clothed with short, adpressed, rigid hairs; neck of calyx half as long as fruiting ovary...*stellata.*

Branches none or few, virgate, glabrous or with few scattered, spreading hairs; neck of calyx as long as fruiting ovary or longer *rostrata.*

*Perianth always 5-merous; anthers narrowed upwards but not beaked; calyx-tube campanulate with large, flat, pectinate scales, of which 5 are alternate with the broad-lanceolate calyx-teeth; a shrub [p. 494] *nepalensis.*

809. Osbeckia truncata Don; F. B. I. ii. 514.
Chota Nagpur; E. Bengal.
A herb, 4–16 in. high.

809/2. Var. Kurzii F. B. I. ii. 514.
Chota Nagpur, Parasnath.
A small herb, 2 in. high.

810. Osbeckia chinensis Linn.; F. I. ii. 224; F. B. I. ii. 515.
Chota Nagpur; N. and E. Bengal; Chittagong.
A herb, 2 feet high.

811. Osbeckia stellata Wall.; F. B. I. ii. 517. *Melastoma crinita* F. I. ii. 402.
Chittagong.
A shrub, 4–6 feet high.

812. Osbeckia rostrata Don; F. B. I. ii. 517. *Melastoma pulchella* F. I. ii. 403.
N. and E. Bengal.
A slender erect shrub, 4–8 feet high.

813. Osbeckia nepalensis Hook.; F. B. I. ii. 521.
N. Bengal, Duars; E. Bengal, Mymensingh.
A rather rigid shrub.

339. **Melastoma** Linn.

Shrubs, villous or strigose; *leaves* opposite, petioled, oblong or lanceolate, entire, 3–7-nerved. *Flowers* terminal, showy, solitary clustered or panicled, purple. *Sepals* usually 5, connate in an ovoid tube, beset with simple, rarely with penicillate hairs; lobes of limb deciduous. *Petals* usually 5. *Stamens* 10, alternately long with purple anthers and with connective produced at base to end in two lobes, and alternately shorter with yellow anthers, the connective not produced but with 2 tubercles in front. *Carpels* connate in a usually 5-celled, rarely 6–7-celled ovary, adnate to calyx-tube, apex setose; ovules very many on radiating axial placentas; style filiform, simple. *Fruit* an irregularly dehiscent, coriaceous, or soft, berry-like capsule. *Seeds* minute, numerous, curved; minutely punctate.

814. MELASTOMA MALABATHRICUM Linn.; F. I. ii. 405; F. B. I. ii. 523; E. D. M. 359.

In all the provinces except C. Bengal and Sundribuns.

A spreading shrub, 5–6 feet high.

340. **Sonerila** Roxb.

Herbs, rarely shrubby below; *leaves* membranous or somewhat fleshy, opposite, those of a pair similar in shape but often different in size or of different shapes and then as if alternate, usually somewhat oblique, 3–7-nerved from the base or near it, rarely penninerved. *Flowers* pink or white, in scorpioid, simple, or falsely umbellate cymes. *Sepals* 3, connate in a turbinate, subcylindric, or campanulate tube; lobes or teeth small. *Petals* 3, ovate or oblong or obovate. *Stamens* 3, equal, rarely 6, and alternately slightly unequal; anthers linear oblong or lanceolate, obtuse acute or acuminate, minutely 2-lobed at base, without appendages; dehiscence apical, porous. *Carpels* connate in a 3-celled ovary with depressed apex, adnate by narrow, longitudinal septa to the calyx-tube; ovules numerous; style filiform; stigma minute or capitellate. *Fruit* a capsule, enclosed in the persistent, spongy calyx-tube, trigonous, subcylindric, turbinate or hemispherical, dehiscing apically by 3 valves or 6 teeth. *Seeds* minute, numerous, ovoid, pyramidal or clavate, smooth or tuberculate.

815. SONERILA TENERA Royle; F. B. I. ii. 530.

Chota Nagpur.

A herb.

341. **Memecylon** Linn.

Glabrous shrubs or trees; *leaves* opposite, short-petioled or sessile, coriaceous, orbicular-ovate or lanceolate, entire, penninerved, rarely 3-nerved. *Flowers* usually in small axillary, rarely terminal, simple or panicled cymes or umbels; bracteoles under the calyx paired. *Sepals* 4, connate in a campanulate, glabrous tube; limb dilated, truncate or shortly lobed. *Petals* 4, blue or white, rarely reddish. *Stamens* 8, equal; filaments long; anthers

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short; connective with a posterior process; dehiscence anterior by chinks. *Carpels* 4, connate in an inferior 1-celled ovary, with glabrous apex capped by a convex or depressed disk with 8 radiating grooves; ovules whorled on a free central placenta, 6–12, rarely more; style filiform, simple. *Fruit* a globose or ellipsoid berry, crowned by the calyx margin. *Seed* solitary, large; cotyledons convolute.

Branchlets rounded or only faintly 4-angled ....*edule*.
Branchlets distinctly 4-angled or almost 4-winged ....*pauciflorum*.

816. MEMECYLON EDULE Roxb.; F. I. ii. 260; F. B. I. ii. 563; E. D. M. 439.
Chittagong.
A shrub or small tree.

817. MEMECYLON PAUCIFLORUM Bl.; F. B. I. ii. 555.
Chittagong.
A small tree.

Order LVI. LYTHRACEÆ.

Trees, shrubs, or herbs, with often 4-angled branches. *Leaves* entire, opposite, sometimes whorled, rarely alternate; stipules 0. *Flowers* regular, hermaphrodite, rarely oblique, very rarely 1-sexual. *Disk* 0, or annular. *Sepals* connate in a calyx with free, persistent tube; lobes 3–6, valvate, often with additional accessory lobes. *Petals* as many as calyx-lobes, rarely 0, inserted near mouth of tube. *Stamens* few or numerous, 1–many-seriate, inserted on calyx-tube, equal or sometimes a few smaller or imperfect; filaments usually filiform, rarely subdeclinate; anthers versatile, inflexed in bud; connective sometimes thickened; dehiscence longitudinal, lateral. *Ovary* free, rarely inferior, in the base of the calyx-tube, 2–6-locular; style long; stigma capitate, rarely 2-lobed; ovules numerous on axial, rarely on parietal placentas. *Fruit* dehiscent or indehiscent, coriaceous or membranous, free or more or less adnate to base of calyx-tube, 2–6-celled, or by absorption of septa 1-celled. *Seeds* numerous, angular, terete, or winged; albumen 0; embryo straight; cotyledons usually flat, sometimes convolute.

*Calyx thin, membranous; low herbs with very small flowers :—[p. 498]
†Herbs in muddy soil; stems not submerged [p. 498 ......**Ammannia**.

†Herbs growing in water; submerged except flower-spike [p. 497] **Hydrolythrum.**

*Calyx thickly herbaceous or coriaceous; trees or shrubs with conspicuous, often showy flowers :—[p. 497]

- Flowers secund; stamens declinate; calyx curved; leaves dotted beneath; calyx-tube free from ovary ....**Woodfordia.**
- Flowers symmetrical; stamens not declinate; calyx straight; leaves not dotted :—
  - Calyx-tube free from ovary :—
    - Stamens definite :—
      - Stamens 4–5, as many as lobes of calyx; petals 0; capsule 2-celled, 2-valved ....**Crypteronia.**
      - Stamens 8, twice as many as lobes of calyx; petals 4; capsule 4-celled, dehiscing irregularly ....**Lawsonia.**
    - Stamens numerous :—
      - Fruit capsular; seeds free, not imbedded in pulp :—
        - Stamens in one row; capsule 4–8-celled; seeds small, faintly winged..**Duabanga.**
        - Stamens in two or more rows; capsule 3–6-celled; seeds large, with a broad wing ....**Lagerstrœmia.**
      - Fruit berry-like, 10–15-celled; seeds imbedded in pulp **Sonneratia.**
  - Calyx-tube adnate to ovary; stamens in several rows; fruit with coriaceous pericarp; seeds pulpy ....**Punica.**

342. **Ammannia** Linn.

Annual glabrous herbs of marshy places; branches often 4-angled; *leaves* opposite and alternate, sometimes whorled, entire; stipules 0. *Flowers* small, often dimorphic, axillary, subsessile, solitary, or in terminal spikes, or in small axillary, 3-chotomous cymes; bracteoles under calyx usually 2. *Sepals* 3–5, connate in a small, campanulate or subtubular calyx, often with minute teeth or folds between the lobes of limb. *Petals* 3–5, small, or sometimes obsolete, inserted on calyx-tube between the teeth. *Stamens* 2–6 or 8, inserted on the calyx-tube. *Carpels* 2–5, connate in a 2–5-celled, or by absorption of septa 1-celled ovary, enclosed in the calyx-tube; ovules numerous on axial placentas; style filiform, short or long; stigma capitate. *Fruit* a globose or ellipsoid, membranous capsule, enclosed in the calyx, opening by 2–4 valves or dehiscing irregularly or transversely. *Seeds* many, small, ellipsoid or nearly hemispheric, with rounded back; with raphe on somewhat flattened inner face.

Flowers in close-set spikes, or axillary solitary; capsule regularly 2–4-valved:—

Calyx in fruit campanulate, tube longer than broad:—

Flowers in close-set terminal spikes:—

Capsule 4-valved, not very much longer than broad; leaves orbicular ....*rotundifolia.*

Capsule 2-valved, much longer than broad; leaves ovate or elliptic *tenuis.*

Flowers axillary, solitary; capsule 2-valved, much longer than broad:—

Cauline leaves elliptic, prominently nerved beneath; floral leaves smaller, usually approximated on axillary subspicate branchlets *peploides.*

Cauline leaves linear; flowers axillary, solitary, not at all spicate; a very minute herb ....*dentelloides.*

Calyx in fruit hemispheric, tube as broad as or broader than long; flowers always solitary axillary:—

Leaves linear; capsule 2-valved; flowers sessile; a very minute herb ....*pygmæa.*

Leaves narrowly oblong or elliptic; capsule 3-valved:—

Flowers distinctly pedicelled, distant below, approximated above; leaves narrowly oblong; a minute herb ....*simpliciuscula.*

Flowers sessile; not at all spicate:—

Leaves elliptic-oblong; stamens always 5:—

Cauline leaves 1 in. long, much larger than floral; stems usually with many opposite, divergent, axillary flower-bearing branches...*pentandra.*

Cauline leaves ·25 in. long, hardly exceeding floral *pentandra* var. *illecebroides.*

Leaves narrowly oblong, subcordate at base; stamens sometimes 6; petals often fimbriate ....*pentandra* var. *fimbriata.*

Flowers in axillary cymes or clusters; capsule bursting irregularly:—

Leaves tapering to the base, usually more or less distinctly petioled; capsule globose; leaves lanceolate.....................................*baccifera.*

Leaves with rounded, cordate, or subauriculate base:—

*Calyx in fruit smooth; capsule globose:—[p. 500]

†Flowers in axillary clusters:—[p. 500]

Flowers sessile, clusters many-flowered; leaves lanceolate, rounded at base; capsule not covered by calyx-teeth *salicifolia.*

Flowers pedicelled, clusters few-(2–5-)flowered; leaves oblong, cordate at base; capsule hidden by calyx-teeth *cordata,*

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†Flowers in peduncled cymes; leaves elongated, oblong, subauricled at base; capsule not covered by calyx-teeth:—[p. 499]
Capsule much exceeding calyx-tube, ·1 in. long...*senegalensis.*
Capsule hardly exceeding calyx-tube, ·05 in. long...*multiflora.*
*Calyx in fruit 4-angled and distinctly 8-ribbed; capsule ellipsoid; flowers in peduncled cymes; leaves elongated, oblong, subauricled at base [p. 499] ....*octandra.*

818. AMMANNIA ROTUNDIFOLIA Ham.; F. I. ii. 425; F. B. I. ii. 566.
In all the provinces.
A common weed in rice-fields and by sides of ditches.

819. AMMANNIA TENUIS Clarke; F. B. I. ii. 567.
Behar; in wet places.
A weed, much less common than preceding.

820. AMMANNIA PEPLOIDES Spreng.; F. B. I. ii. 566. *A. nana* F. I. ii. 427.
In all the provinces.
A common weed in rice-fields and beside ditches.

821. AMMANNIA DENTELLOIDES Kurz; F. B. I. ii. 568.
Behar, on Parasnath; N. Bengal, common.
A pygmy weedlet, on wet roadways, &c.

822. AMMANNIA PYGMÆA Kurz; F. B. I. ii. 568.
In all the provinces.
A pygmy weedlet, on wet roadways, &c.

823. AMMANNIA SIMPLICIUSCULA Kurz; F. B. I. ii. 568.
Chittagong.
A pygmy weed, on borders of rice-fields.

824. AMMANNIA PENTANDRA Roxb.; F. I. ii. 425; F. B. I. ii. 568.
In all the provinces.
A common weed of rice-fields, roadside ditches, and other moist spots.

824/2. Var. ILLECEBROIDES F. B. I. ii. 569.
Chota Nagpur; Orissa.
A rice-field weed.

824/3. Var. FIMBRIATA F. B. I. ii. 569.
C. and E. Bengal; Chittagong.
A rice-field weed.

825. AMMANNIA BACCIFERA Linn.; F. B. I. ii. 569; E. D. A. 958.
A. vesicatoria F. I. i. 426.
In all the provinces.
A common weed of all wet places. *Vernac.* Dád mári.

826. AMMANNIA SALICIFOLIA Monti; F. B. I. ii. 569.
Behar; C. and E. Bengal; Sundribuns.
A weed of wet places, less frequent than the preceding.

827. AMMANNIA CORDATA W. & A.; F. B. I. ii. 570.
E. Bengal.
A weed of wet places, very rare in our area.

828. AMMANNIA SENEGALENSIS Lamk; F. B. I. ii. 570; E. D. A. 960.
Tirhut; N. Bengal, Purnea.
A weed of wet places. *Vernac.* Dád mári.

829. AMMANNIA MULTIFLORA Roxb.; F. I. i. 426; F. B. I. ii. 570.
In all the provinces.
A weed of wet places.

830. AMMANNIA OCTANDRA Linn. f.; F. I. i. 425; F. B. I. ii. 571.
Chittagong.
A weed of rice-fields.

343. **Hydrolythrum** Hook. f.

A glabrous, aquatic herb; lower submerged *leaves* whorled, linear; spikes rising above the water with oblong, bracteiform leaves. *Flowers* small, whorled, subsessile, in axils of bract-like leaves; lower whorls distant, upper aggregate, with bracts often there opposite; bracteoles under calyx 2, subulate. *Sepals* 4, connate in a campanulate calyx; lobes of limb triangular, without accessory teeth. *Petals* 4, inserted between the calyx-lobes. *Stamens* 4, inserted on calyx-tube, with 4 hypogynous, 2-fid scales within them. *Carpels* 2, connate in a free, 2-celled ovary at the base of the calyx-tube; ovules few, on axial placentas; style simple; stigma capitate. *Fruit* a small, globose, 2-celled capsule. *Seeds* 3–4 in each cell, ovoid, concave.

831. HYDROLYTHRUM WALLICHII Hook. f.; F. B. I. ii. 572.
N. Bengal, Duars, in ditches.
A water-weed, submerged except the flower-spikes.

344. **Woodfordia** Salisb.

A shrub; *leaves* opposite, subsessile, entire, lanceolate, paler beneath with black, glandular dots. *Flowers* scarlet, in short, paniculate cymes on axillary peduncles, rarely solitary; bracteoles 2 at base of pedicels. *Sepals* 6, connate in a long, tubular, slightly curved calyx; limb oblique; lobes short, with 6 accessory, minute teeth between the lobes. *Petals* small, 6, inserted at mouth of calyx-tube, sometimes obsolete. *Stamens* 12, declinate, inserted below the middle of the calyx-tube. *Carpels* 2, connate in a free, sessile, oblong, 2-celled ovary at the base of the calyx-tube; ovules numerous on axial placentas; style filiform; stigma small. *Fruit* an ellipsoid, membranous capsule, included in the calyx. *Seeds* numerous, narrowly cuneate, obovate, smooth.

832. WOODFORDIA FLORIBUNDA Salisb.; F. B. I. ii. 572; E. D. W. 106. *Grislea tomentosa* F. I. ii. 233.
Behar; Chota Nagpur; N. Bengal.
A shrub with long, spreading branches and red flowers.
Vernac. Dhas, dhani; *Kol.* and *Santal.* Icha, ichak'.

345. **Lawsonia** Linn.

A glabrous erect shrub, with terete, sometimes spinous branches; *leaves* opposite, entire, lanceolate. *Flowers* rather small, in large, terminal, panicled cymes; bracts small, deciduous. *Sepals* 4, ovate, very shortly connate below. *Petals* 4, obovate, wrinkled, inserted on the short calyx-tube. *Stamens* usually 8, inserted in pairs between the petals, occasionally not paired, sometimes only 4. *Carpels* 4, connate in a completely or partially 4-celled, free ovary; ovules numerous on axial placentas; style long; stigma capitate. *Fruit* a coriaceous, globose, irregularly dehiscing, ultimately 1-celled capsule. *Seeds* numerous, angular, pyramidal, smooth, close-set on a central placenta.

833. LAWSONIA ALBA Lamk; F. B. I. ii. 573; E. D. L. 126. *L. inermis* F. I. ii. 258.
Planted, especially in hedges, and chiefly in the western provinces.
A shrub or small tree. Mehndi, Henna, or Indian Privet.

346. **Crypteronia** Bl.

Trees; leaves opposite, entire, ovate or lanceolate, petioled. *Flowers* minute, white or green, polygamo-diœcious, in panicles with long, slender racemes; bracts at base of pedicels linear, minute. *Sepals* 5, rarely 4, connate in a small, saucer-shaped, or subhemispheric tube; lobes persistent, valvate. *Petals* 0. *Stamens* 5 or 4, inserted between the calyx-teeth. *Carpels* 2, connate in a free, globose, 2-celled ovary; ovules numerous, on axial placentas; style long, stigma sub-2-fid. *Fruit* a globose,

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2-celled capsule, tipped by the persistent style, opening at the top across the septum so as to split the style; pedicel in fruit deflexed. *Seeds* many, ellipsoid; testa produced at each end.

834. CRYPTERONIA PANICULATA Bl. *C. glabra* F. B. I. ii. 574.

Chittagong.

A tall, erect tree.

347. **Lagerstrœmia** Linn.

Trees or shrubs; *leaves* opposite, distichous, or the uppermost alternate, entire, oblong or ovate. *Flowers* showy, often large, in axillary and terminal lax, less often dense, 3-chotomous panicles; bracts 2 at apex of peduncles; bracteoles 2 on the pedicels. *Sepals* 6, sometimes 7–9, connate in a funnel-shaped, smooth, grooved, angled or almost winged calyx-tube; lobes ovate, subacute, valvate. *Petals* 6, sometimes 7–9, rarely 0, inserted at apex of calyx-tube, with distinct claw, wrinkled, and with cusped, erose, or fimbriate margins. *Stamens* numerous, inserted near base of calyx-tube; filaments long, exserted. *Carpels* 3–6, connate in a 3–6-celled ovary, sessile at the base of the calyx-tube; ovules many, ascending, on axial placentas; style long, curved; stigma capitate. *Fruit* an ellipsoid, coriaceous or woody capsule, somewhat adnate below to the calyx, smooth, ellipsoid, with 3–6 cells and as many valves. *Seeds* numerous, rarely few, elongated, flat, erect, winged from their apex.

Calyx-tube smooth, rounded, glabrous:—
  Leaves whitish beneath; flowers hardly ·5 in. across; trees:—
    Leaves 2–3·5 in. long; capsule 1 in. long or less ....*parviflora*.
    Leaves 4–5 in. long; capsule 1·5 in. long or more *parviflora* var. *majuscula*.
  Leaves green beneath; flowers 1·5 in. across or larger; a shrub *indica*.
Calyx-tube 12–14-ribbed and -grooved, covered with a harsh grey pubescence; flowers 2·5 in. across; trees:—
  Leaves long, lanceolate; not pitted and little reticulated above *Flos-Reginæ*.
  Leaves broad, elliptic, obtuse or short cuspidate; distinctly pitted in the recesses between the pronounced reticulations above...*macrocarpa*.

835. LAGERSTRŒMIA PARVIFLORA Roxb.; F. I. ii. 505; F. B. I. ii. 575; E. D. L. 55.

W. Bengal; Behar; Orissa,

A tree, 60 feet high. *Beng.* Sida; *Uriya* Salora; *Santal.* Sekrek; *Hind.* Bakli, seina.

835/2. Var. MAJUSCULA F. B. I. ii. 575.
Chota Nagpur; S. Behar.
A tree, 60 feet high. *Kol.* Saikre; *Santal.* Sekrek.

836. LAGERSTRŒMIA INDICA Linn.; F. I. ii. 505; F. B. I. ii. 575; E. D. L. 52.
Planted in gardens in all the provinces.
A showy shrub. *Vernac.* Farash, Telinga-china.

837. LAGERSTRŒMIA FLOS-REGINÆ Retz; F. B. I. ii. 577; E. D. L. 42. *L. Reginæ* F. I. ii. 505.
Chota Nagpur; Chittagong; often also elsewhere planted.
A showy tree. *Vernac.* Jarool; *Kol.* and *Santal.* Sekra.

838. LAGERSTRŒMIA MACROCARPA Wall.
Chittagong.
A large tree.

348. **Duabanga** Ham.

Large trees with drooping, 4-angled branches; *leaves* opposite, distichous, large, short-petioled, acute, entire, with rounded or cordate base. *Flowers* large, in terminal panicles with opposite branches. *Sepals* 4–7, thickly leathery, connate below in a wide calyx-tube adnate to the ovary; lobes valvate. *Petals* 4–7, clawed, white, obovate, crisped and undulate. *Stamens* many, inserted on a perigynous disk. *Carpels* 4–8, connate in a conical, 4–8-celled ovary; ovules very numerous, on diffuse placentas, covering nearly the whole of the inner walls of carpels; style long, curved; stigma capitate, 4–8-lobed. *Fruit* a globose, coriaceous, more or less perfectly 4–8-celled capsule, seated on the spreading leathery calyx; valves 4–8. *Seeds* very many, minute, ellipsoid; testa produced at both ends into longish tails.

839. DUABANGA SONNERATIOIDES Ham.; F. B. I. ii. 579. *Lagerstrœmia grandiflora* F. I. ii. 503.
N. Bengal, Duars; Chittagong.
A very tall tree. *Beng.* Bandorhulla; *Magh.* Baichua.

349. **Sonneratia** Linn. f.

Glabrous, littoral trees; *leaves* opposite, petioled, coriaceous, entire. *Flowers* large, solitary axillary, or in threes at ends of

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branches; bracts 0. *Sepals* 4–8, thickly leathery, connate below in a widely campanulate calyx; lobes lanceolate, valvate. *Petals* 4–8, linear-oblong, or 0. *Stamens* numerous, inserted in a circular band on the calyx-tube. *Carpels* many, connate in a many-celled ovary, only adnate at its base to the calyx-tube; ovules many, ascending, on axial placentas; style long; stigma capitate. *Fruit* a subglobose, 10–15-celled berry, supported by the persistent calyx. *Seeds* very many, small, angular, curved; cotyledons convolute.

Leaves narrow-oblong; calyx 4-lobed; petals 0; stigma very large, umbrella-shaped .... *apetala*.
Leaves oblong or obovate-elliptic; calyx 6-lobed; petals 6; stigma capitate, not very large .... *acida*.

840. Sonneratia apetala Ham.; F. I. ii. 506; F. B. I. ii. 579; E. D. s. 2369.

Sundribuns.

A tree 40 feet high. *Beng.* Keora.

841. Sonneratia acida Linn. f.; F. I. ii. 506; F. B. I. ii. 579; E. D. s. 2362.

Sundribuns.

A small tree 15 feet high. *Beng.* Ora.

350. **Punica** Linn.

A large shrub; branches terete, often spiny; *leaves* opposite, subopposite or clustered, oblong or obovate, obtuse, entire. *Flowers* large, orange-red, axillary solitary, or several clustered. *Sepals* 5–7, connate in a funnel-shaped, coriaceous calyx, below adnate to and above produced beyond the ovary; lobes of limb persistent. *Petals* 5–7, lanceolate, wrinkled, inserted between calyx-lobes. *Stamens* numerous, inserted round mouth of calyx. *Carpels* many, 2-seriate, connate in a many-celled, inferior ovary; ovules very numerous; placentas in some cells axial, in others parietal; style long, bent; stigma capitate. *Fruit* an inferior, globose, many-celled berry, with a hard rind, crowned by the persistent calyx-lobes. *Seeds* very many, angular; testa coriaceous, with a thinly pulpy outer coat; cotyledons convolute.

842. Punica Granatum Linn.; F. I. ii. 499; F. B. I. ii. 581; E. D. p. 1426.

In gardens, in the western and northern provinces especially.

A shrub. *Hind.* Anar, darim; *Beng.* and *Uriya* Dalim. The Pomegranate.

Order LVII. ONAGRACEÆ.

Annual or perennial herbs, sometimes aquatic, rarely shrubs. *Leaves* opposite or alternate, entire or toothed, rarely (in some aquatic species) the submerged leaves much divided; stipules 0. *Flowers* hermaphrodite, regular or slightly irregular, axillary solitary, rarely spiked or racemed at ends of branches. *Disk* epigynous, lining calyx-tube. *Sepals* connate in a tube adnate to ovary, produced beyond ovary in a valvately 2–5-lobed limb. *Petals* 2–5, alternate with lobes of calyx, rarely 0. *Stamens* 1–8, rarely 5, 6, or 12, 1–2-seriately attached along with petals to the disk, sometimes one series imperfect; filaments filiform, sometimes declinate; anthers dorsifixed; dehiscence longitudinal, introrse. *Ovary* inferior, rarely half-inferior, 1–6-locular, most usually 4-locular, or 1-locular from absorption of septa; style filiform, entire; stigma capitate, entire or 4-lobed or 4-partite; ovules usually anatropous, solitary, or numerous 1-seriate, rarely numerous many-seriate. *Fruit* dehiscent capsular, either septicidally or loculicidally 4-valved with persistent axis, or indehiscent nutlike, or a berry. *Seeds* many, few, or solitary, usually small; albumen 0 or very scanty; embryo usually obovoid.

Seeds numerous; plants growing in swamps :—
  Stamens twice as many as lobes of calyx ....**Jussiæa.**
  Stamens equal in number to lobes of calyx ....**Ludwigia.**
Seed solitary; an aquatic, with spongy dilatations on the leaf-stalks **Trapa.**

351. Jussiæa Linn.

Herbs or undershrubs, marsh or aquatic; *leaves* alternate, usually entire. *Flowers* axillary, solitary, yellow or white; bracteoles usually 2 at apex of pedicel. *Sepals* 4–6, connate in a linear calyx-tube, hardly produced beyond ovary; lobes of limb acute, persistent. *Petals* 4–6, epigynous. *Stamens* 8, 10, or 12, epigynous. *Carpels* 4–6, connate in an inferior 4–6-celled ovary; ovules many, several-seriate on vertical axial placentas; style simple, usually short, stigma 4–6-lobed. *Fruit* a linear, terete, or angled, 4–6-celled, and 8–12-ribbed capsule; dehiscence septicidal the ribs persistent, or irregular between the ribs. *Seeds* numerous; testa hard or spongy; cotyledons obtuse.

Leaves obovate or oblanceolate, obtuse; petals 5 (rarely 6), white; stems floating or creeping ....*repens*.
Leaves lanceolate, acute; petals 4, yellow; stems erect ......*suffruticosa*.

843. Jussiæa repens Linn.; F. I. ii. 401; F. B. I. ii. 587.

In all the provinces.

A herb, creeping in mud on margins of tanks and floating on the surface of the water. *Beng.* Kesara-dam.

844. Jussiæa suffruticosa Linn.; F. B. I. ii. 587; E. D. J. 114.

J. exaltata F. I. ii. 401.

A herb or undershrub, in moist places. *Beng.* Lal banlanga; *Santal.* Dak ichak'.

352. Ludwigia Linn.

Herbs; *leaves* alternate, undivided, subentire. *Flowers* usually axillary, solitary, sessile or subsessile; bracteoles under calyx 2. *Sepals* 3–5, connate in a tube, hardly produced beyond ovary; lobes acute, persistent. *Petals* 3–5, epigynous, sometimes 0. *Stamens* 4–5, epigynous. *Carpels* 4–5, connate in an inferior, 4–5-celled ovary; ovules numerous, 2–several-seriate on axial placentas; style simple; stigma capitate. *Fruit* a linear or oblong, 4–5-celled capsule, opening by terminal pores or rupturing irregularly along the sides. *Seeds* many, obovoid, smooth.

Capsule inflated, smooth; seeds in many rows in each cell, not distinguishable through its walls ....*parviflora*.
Capsule not inflated, torulose; seeds in one row in each cell, showing themselves prominently through its walls ....*prostrata*.

845. Ludwigia parviflora Roxb.; F. I. i. 419; F. B. I. ii. 588.

W. Bengal; Behar; Chota Nagpur.

An erect herb, in rice-fields.

846. Ludwigia prostrata Roxb.; F. I. i. 420; F. B. I. ii. 588.

N. and E. Bengal.

A prostrate or decumbent herb, in rice-fields.

353. Trapa Linn.

Aquatic, floating herbs; *leaves* dimorphic, submerged, opposite, rootlike, pinnatipartite; floating rosulate, rhomboid, the petiole with a spongy swelling near its apex. *Flowers* axillary, solitary, peduncled. *Sepals* 4, connate in a short tube, adnate to the base of the ovary; lobes persistent, 2 or all becoming spinescent in fruit. *Petals* 4, small, white, inserted on the margin of the epigynous disk. *Stamens* 4. *Carpels* 2, connate in a half-inferior, 2-celled ovary; ovule solitary in each cell, pendulous from near top of inner angle; style subulate; stigma capitate. *Fruit* a large, obovoid, bony nut, with 4 prominent angles, 2 or all of which are spinescent; apical, cylindric beak perforate for protrusion of the radicle. *Seed* solitary, inverted; cotyledons very unequal.

Leaves very villous beneath, 2 in. long, 3 in. wide, faintly crenate in front ....*bispinosa*.
Leaves slightly villous beneath, ·5 in. long, ·75 in. wide, incised-serrate in front ....*bispinosa* var. *incisa*.

847. TRAPA BISPINOSA Roxb.; F. I. i. 428; F. B. I. ii. 590; E. D. T. 516.
In all the provinces.
A floating aquatic. *Beng.* Singhara; Pani-phal.

847/2. Var. INCISA F. B. I. ii. 590.
Chota Nagpur.
A floating aquatic.

Order LVIII. SAMYDACEÆ.

Trees or shrubs. *Leaves* alternate, often distichous, simple, entire or slightly serrate, often linear-punctulate beneath; stipules small, deciduous. *Flowers* regular, usually hermaphrodite, small, axillary, short-pedicelled, fascicled, or less often in racemes or panicles. *Disk* perigynous or hypogynous, annular, cupular or glandular. *Sepals* connate in a persistent calyx, with a short, free tube, or a longer tube adnate to ovary; limb 3–7-fid, lobes imbricate or valvate. *Petals* as many as calyx-lobes, perigynous, imbricate, rarely 0. *Stamens* few or numerous, 1–many-seriate, often alternating with staminodes, free or connate below in a short tube, or connate in bundles opposite the petals; anthers didymous or oblong; dehiscence longitudinal, either introrse or extrorse. *Ovary* free or half-superior, 1-locular; style single with stigma capitate or 3-fid, or rarely styles 3; ovules many or few on 2–5, usually 3 parietal placentas. *Fruit* a loculicidal, 2–5-, usually 3-valved, capsule; valves bearing the seeds along their centre. *Seeds* few or many, oblong or angular; albumen fleshy; embryo axial, but shorter than the albumen.

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Petals absent; flowers in axillary fascicles............................**Casearia.**
Petals present; flowers in axillary and terminal racemes......**Homalium.**

354. **Casearia** Jacq.

Shrubs or small trees; *leaves* simple, alternate, distichous, petioled, entire or slightly serrate, minutely linear-punctate beneath; stipules small, lateral, caducous. *Flowers* small, greenish-yellow, axillary, fascicled; pedicels short, jointed; bracts scale-like, numerous. *Sepals* 4–5, connate below, imbricate, obtuse, persistent. *Petals* 0. *Stamens* 8–10, connate below in a hypogynous, sometimes very short, tube; filaments free above with alternating staminodes. *Carpels* 3, or sometimes 2, connate in a free, ovoid, 1-celled ovary; ovules many, placentas parietal; style simple; stigma capitate or 3-fid. *Fruit* succulent, globose or ovoid or ellipsoid, smooth or 3-angled or 6-ribbed, opening by 3, rarely 2, valves. *Seeds* many, angular or obovoid, with a fleshy arillus; embryo straight.

Adult leaves and petioles glabrous beneath ....*graveolens.*
Adult leaves, at least on the midrib and petioles, more or less pubescent beneath:—
  Leaves oblong, closely serrate, softly hairy beneath ....*Vareca.*
  Leaves elliptic-oblong to lanceolate, crenate, pubescent, or glabrous except midrib and petiole, beneath ....*tomentosa.*

848. CASEARIA GRAVEOLENS Dalz.; F B. I. ii. 592; E. D. C. 722.
Behar; Chota Nagpur.
A shrub or small tree. *Hind.* Chilla, pimpri; *Kol.* Rari; *Santal.* Neuri.

849. CASEARIA VARECA Roxb.; F. I. ii. 418; F. B. I. ii. 593.
Tippera; Chittagong.
A shrub.

850. CASEARIA TOMENTOSA Roxb.; F. I. ii. 421; F. B. I. ii. 593; E. D. C. 725.
In all the provinces.
A shrub or small tree. *Hindi* Chilla, baira; *Kol.* Roré; *Santal.* Chorcho; *Uriya* Girari.

355. **Homalium** Jacq.

Shrubs or trees; *leaves* simple, alternate, entire or subentire, petioled or sessile, rarely punctulate. *Flowers* small, pubescent, in slender axillary and subterminal racemes or panicles; bracts at base of pedicels often prominent, caducous. *Sepals* 5–7, connate in a funnel-shaped calyx-tube, adnate to base of ovary; lobes narrow, persistent. *Petals* 4–8, inserted in the throat of the calyx, linear-oblong, persistent. *Stamens* 4–many, solitary or in fascicles of 2 or more (in our only species in fascicles of 3), opposite the petals with alternating glandular staminodes. *Carpels* 2–5, connate in a half-superior, 1-celled ovary; ovules several or many; placentas parietal, confined to the portion of ovary beyond the calyx; styles 2–5, filiform; stigmas capitellate. *Fruit* a coriaceous, half-superior capsule, opening at the top by 2–5 valves. *Seeds* few, angular or oblong.

851. HOMALIUM SCHLICHII Kurz; F. B. I. ii. 597.
Chittagong.
A tree.

Order LIX. TURNERACEÆ.

Herbs or shrubs. *Leaves* alternate, entire or pinnatifid, usually sharply serrate, often 2-glandular at the base; stipules small or 0. *Flowers* regular, hermaphrodite, axillary solitary, or few, rarely racemose; peduncles free or adnate to petiole, often articulate, usually 2-bracteolate. *Disk* lining calyx-tube. *Sepals* connate in a tubular, 5-fid, deciduous calyx with imbricate lobes. *Petals* 5, inserted in throat of calyx-tube, clawed, membranous, contorted, sometimes with a fimbriate scale. *Stamens* 5, inserted on the calyx-tube, rarely hypogynous; filaments free; anthers oblong; dehiscence longitudinal, introrse. *Ovary* free, ovoid or elongated, 1-locular; styles 3, terminal, filiform, simple or 2-fid; stigmas flabellate, multifid, rarely merely dilated; ovules numerous, anatropous, 2-seriate on 3 parietal placentas. *Fruit* a 1-celled capsule, 3-valved at the top or throughout; valves bearing the seeds along their centre. *Seeds* oblong, cylindric, slightly curved, with a membranous arillus, and firm, pitted testa; albumen fleshy; embryo cylindric, axial.

356. Turnera Linn.

Herbs, undershrubs or shrubs; *leaves* alternate, simple, entire, serrate or pinnately lobed, usually 2-glandular at base; stipules small or 0. *Flowers* axillary, solitary, rarely fascicled or in racemes, yellow, peduncle sometimes adnate to petiole; bracteoles 2 or 0. *Sepals* 5, connate in a campanulate or narrow calyx-tube; lobes of limb oblong or linear, imbricate. *Petals* 5, inserted in calyx-throat. *Stamens* 5, inserted on the calyx below the petals, or sometimes quite hypogynous; filaments free, flattened; anthers oblong. *Carpels* 3, connate in a free, sessile, oblong, 1-celled ovary; ovules many, 2-seriate on 3 parietal placentas; styles 3, quite free or occasionally connate at the base; stigmas flabellately 3–5- or more-fid. *Fruit* an ovoid or oblong, many-seeded or rarely 3-seeded capsule, opening completely by 3 valves. *Seeds* confined to centre of placentas, oblong or cylindric, curved, with a membranous arillus; albumen fleshy; embryo axial, cylindric.

852. TURNERA ULMIFOLIA Linn.

In most of the provinces; an escape from gardens.
An undershrub.

Order LX. PASSIFLOREÆ.

Herbs or shrubs, almost always twining or climbing. *Leaves* alternate, simple or lobed, penninerved or palminerved, often glandular beneath; petiole often glandular; stipules 2, deciduous or persistent, sometimes 0; tendrils axillary or 0. *Flowers* regular, hermaphrodite or 1-sexual; usually 3-bracteolate, with bracteoles small and scattered or large and forming a leafy epicalyx, rarely 0; axillary cymose, with sometimes one or more of the branchlets transformed as a tendril, rarely flowers solitary. *Disk* urceolate, annular or split into staminode-like glands, rarely 0. *Sepals* 5, connate in a calyx with tubular base, fleshy or subcoriaceous, less often membranous, imbricate. *Petals* 0, or 5 attached to calyx-tube, membranous or fleshy, imbricate, marcescent; corona above the disk usually present. *Stamens* 5, adnate to a gynophore or free at the base, perigynous; anthers oblong, 2-celled, basifixed or versatile; dehiscence longitudinal, lateral or introrse. *Ovary* superior, usually on a gynophore, sometimes subsessile, 1-locular with 3 parietal placentas, in ♂ flowers rudimentary or absent; styles 1 or 3; stigmas reniform, capitate or flattened; ovules numerous, anatropous, pendulous. *Fruit* a berry or capsule. *Seeds* many, ovoid or flattened, with a fleshy arillus; testa often pitted; albumen fleshy, rarely scanty; embryo straight, with usually leafy cotyledons.

Flowers hermaphrodite; corona of corolla conspicuous; tendril-bearing herbs .... **Passiflora.**
Flowers unisexual; corona of corolla small or none:—
  Male and female corollas similar; tendril-bearing herbs or shrubs **Modecca.**
  Male and female corollas dissimilar; erect trees with soft stems **Carica.**

357. **Passiflora** Linn.

Twining shrubs, with usually lateral, simple tendrils; *leaves* simple or palmately lobed, usually with glands on under-surface and petiole; stipules slender or leafy. *Flowers* solitary or cymose; bracteoles 3, alternate. *Sepals* 5, connate in a fleshy calyx-tube; lobes of limb linear. *Petals* 5, inserted on calyx-throat; with corona of slender filaments within the corolla, springing from throat of calyx and from one or more membranous folds lower down, and with a basilar, membranous cup surrounding the base of a distinct gynandrophore. *Stamens* 5, arising from apex of gynandrophore; filaments flat; anthers oblong, dorsifixed. *Carpels* 3, connate in a one-celled ovary, crowning the gynandrophore; ovules numerous; styles 3; stigmas reniform, capitate. *Fruit* a fleshy berry. *Seeds* many, rarely few, arillate.

Flowers small, without petals; bracts none, or if present not forming an involucre under the flower .... *suberosa.*
Flowers large, showy; bracts 3, forming an involucre underneath the flowers:—
  Leaflets of the involucre finely pinnatifid, the ultimate segments dissected, setaceous .... *fœtida.*
  Leaflets of the involucre entire or toothed:—
    Branches terete; stipules large, foliaceous.................. *adenophylla.*
    Branches quadrangular, faintly winged along the corners *quadrangularis.*

853. PASSIFLORA SUBEROSA Linn.; F. B. I. ii. 599.

C. and E. Bengal; Sundribuns; Chittagong.

A herb climbing in hedges and thickets; a native of America, but quite naturalised.

854. PASSIFLORA FŒTIDA Linn.; F. B. I. ii. 599.

C. Bengal; Chittagong.

A climbing slender shrub in hedges near villages; a native of America, but fairly naturalised.

855. Passiflora adenophylla Mast.
N. Bengal, naturalised.
A garden escape.

856. Passiflora quadrangularis Linn.
N. Bengal, naturalised.
A garden escape.

358. **Modecca** Lamk.

Twining herbs or undershrubs, with simple lateral tendrils; *leaves* entire or palmately lobed, usually with 2 or more flat, circular glands on the under-surface, and with similar glands at apex of petiole; stipules inconspicuous or 0. *Flowers* monœcious, in few- or many-flowered axillary cymes, the peduncles long, one or more being sterile and converted into tendrils. ♂ ♀ *Sepals* 5, connate in a tubular or campanulate calyx-tube; lobes of limb imbricate, coriaceous. *Petals* 5, free, membranous, 1-nerved, inserted on calyx-tube, those of ♀ rather smaller. *Corona* 0 or reduced to a fimbriate ring. ♂ *Stamens* 5, inserted at base of calyx-tube, opposite as many scales or glands; filaments linear, subulate, connate below or quite free; anthers basifixed, the connective often mucronate: rudimentary *ovary* very small or 0. ♀ *Staminodes* 5, connate below in a cup round base of ovary, opposite as many ligulate, capitate glands. *Carpels* 3, connate in a globose or elliptic, sessile or stalked, round or angled, 1-celled ovary; ovules many on parietal placentas; style cylindric, short, or 0; stigmas 3, capitate or flattened and dilated. *Fruit* a fleshy or coriaceous, 3-valved capsule. *Seeds* many, ovate, compressed, arillate, with long funicles; albumen fleshy.

857. Modecca trilobata Roxb.; F. I. iii. 133; F. B. I. ii. 602.
Chittagong.
A large climber. *Vernac.* Akand-phul.

359. **Carica** Linn.

Trees or shrubs, with spongy stems and milky juice; *leaves* large, flaccid, long-petioled, palmately lobed, subpeltate; stipules 0. *Flowers* whitish, diœcious, the male laxly panicled, the female fascicled. *Sepals* 5, connate in a small, campanulate calyx. ♂ *Petals* 5, connate in a salver-shaped corolla with elongated, slender tube; lobes oblong or linear, valvate or contorted. *Stamens* 10, inserted on the corolla-throat; anthers 2-seriate, adnate; 5 on short filaments, alternate with corolla-lobes, 5 sessile, opposite corolla-lobes; dehiscence introrse, connective usually produced. *Ovary* reduced to a subulate process. ♀ *Petals* 5, free, linear-oblong, erect, deciduous. *Staminodes* 0. *Carpels* 5, connate in a sessile, 1-celled ovary; ovules many, several-seriate on 5 parietal placentas; style short or 0, stigmas 5, linear or flattened, simple or lobed. *Fruit* a large, fleshy, somewhat furrowed, many-seeded berry. *Seeds* ovoid, with an adnate arillus; albumen fleshy.

858. Carica Papaya Linn.; F. I. iii. 824; F. B. I. ii. 599; E. D. C. 581.

Generally cultivated and often subspontaneous.

An erect small tree; native of America. *Vernac.* Pippiya (*from the American name*). The Papaw.

Order LXI. CUCURBITACEÆ.

Herbs or shrubs, climbing by means of solitary, lateral, spiral, simple or divided tendrils. *Leaves* alternate, petioled, often cordate, simple, lobed or pedately divided; stipules modified or 0. *Flowers* regular, 1-sexual, monœcious or diœcious, usually panicled, rarely racemose or subumbellate, often solitary, usually yellow or white. *Disk* 0. *Sepals* united in a calyx, with tube almost always quite adnate to ovary; limb rotate, campanulate, or tubular; lobes 5, rarely 3, imbricate. *Petals* 5, inserted on the calyx-limb, connate in a tube or almost or quite free, sometimes fimbriate at margin, valvate or involute in bud. *Stamens* inserted at the mouth or near the middle or at base of calyx-tube, usually 3, sometimes 5 or 2; anthers free or connate in a tube, usually one 1-celled and two 2-celled, cells straight or flexuous or conduplicate, the connective sometimes produced; dehiscence longitudinal or in curves, following folds of anther-cells, extrorse. *Ovary* inferior, rarely half-superior, usually of 3 connate carpels, normally 1-locular; style 1, stigmas 3, more rarely styles 2 or 3 or 4; ovules usually many, horizontal, rarely pendulous, sometimes few, pendulous, usually 2-seriate on 3 vertical, parietal, or partially or completely intruded placentas, which render the ovary occasionally spuriously 3-locular. *Fruit* usually a gourd or berry, indehiscent or opening by valves or by a stopple, usually 1-celled, less often spuriously 3-celled, the seeds embedded in pulp or fibre. *Seeds* usually many, often com-

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pressed, horizontal, or pendulous; testa often with corrugate or spinose margins; albumen 0; embryo with leafy cotyledons.

*Anthers 2-celled; ovules horizontal or very rarely pendulous; female flowers usually solitary, never panicled; leaves never divided into distinct leaflets :—[p. 516]

†Anther-cells folded together or sigmoidly curved :—[p. 516]

Corolla rotate, or, if campanulate, divided almost or quite to the base into 5 free petals :—

Petals fimbriate at their margins :—

Ovules 12, perfect seeds usually 6, each with an abortive seed attached to its side; tube of calyx 3 in. long or longer **Hodgsonia.**

Ovules almost pendulous and seeds very numerous; tube of calyx less than 3 in. long .... **Trichosanthes.**

Petals with entire margins :—

Calyx-tube of male flowers elongated; stamens inserted within and included in the calyx-tube; anthers cohering in an oblong head :—

Tendrils simple; stigmatic lobes of the female flower linear, simple; petiole without glands .... **Gymnopetalum.**

Tendrils divided; stigmatic lobes of the female flower 2-lobed; petiole with 2 glands at its apex ...... **Lagenaria.**

Calyx-tube of male flowers short :—

Stamens inserted at the mouth of the calyx; filaments exserted, recurved; anthers free :—

Fruit dry; endocarp fibrous, opening by a stopple; male flowers partly in racemes .... **Luffa.**

Fruit soft; endocarp fleshy, indehiscent; male and female flowers alike solitary .... **Benincasa.**

Stamens inserted below the mouth of the calyx; filaments hardly exserted, not recurved; anthers more or less coherent :—

Calyx with 2–3 scales at its base; male flowers with usually a large enveloping bract; tendrils simple **Momordica.**

Calyx without scales at its base; male flowers with no enveloping bract :—

Connective produced beyond anther-cells; tendrils simple **Cucumis.**

Connective not produced; tendrils 2–3-fid ...... **Citrullus.**

Corolla campanulate, not divided much more than half-way down :—

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Flowers white ; tendrils simple............................**Cephalandra.**
Flowers yellow ; tendrils 2–3-cleft ....**Cucurbita.**
†Anther-cells straight, or, if curved (*Bryonia*), not conduplicate nor sigmoid :—[p. 515]
Flowers large, deep-yellow ; male racemes stout ......**Thladiantha.**
Flowers small, pale-yellow ; male pedicels or racemes slender :—
Male and female pedicels alike 1-flowered, clustered :—
Tendrils simple ....**Mukia.**
Tendrils 2-fid ....**Bryonia.**
Male flowers in corymbs, umbels, or racemes :—
Connective produced ; fruits on capillary pedicels ; male flowers usually racemed ....**Melothria.**
Connective not produced ; fruits on short pedicels ; male flowers usually corymbose or subumbellate ....**Zehneria.**
*Anthers 1-celled, cells straight ; stamens always free ; ovules always pendulous ; flowers small, the female ones in panicles or many-flowered racemes :—[p. 515]
Leaves not divided into separate leaflets ....**Actinostemma.**
Leaves pedately divided into 3–5 leaflets.....................**Gynostemma.**

360. **Hodgsonia** Hook. f. & Thoms.

A large climber ; *leaves* coriaceous, palmately lobed, long-petioled ; tendrils 2–3-fid. *Flowers* large, diœcious ; males in long racemes ; bracts oblong, entire ; females solitary. *Sepals* 5, connate in a long tube, with shortly campanulate mouth ; lobes short. *Petals* 5, connate at the base only, margins very long, fimbriate. ♂ *Stamens* 3, with very short filaments ; anthers connate, exserted, two 2-celled, one 1-celled, cells conduplicate. ♀ *Carpels* 3, connate in a globose, 1-celled ovary ; placentas 3, parietal, but only near base, each 2-seriately 4-ovuled ; style long ; stigmas 3, oblong, bifid, exserted. *Fruit* a large, depressed, globose, 12-grooved, hard berry. *Seeds* usually 6, perfect, flat, ellipsoid, with sunk veins, each with usually an imperfect seed laterally attached.

859. HODGSONIA HETEROCLITA Hook. f. & Thoms. ; F. B. I. ii. 606.
Trichosanthes heteroclita F. I. iii. 705.

Chittagong.

An enormous climber, stem sometimes 100 feet long. *Vernac.* Gulur.

361. Trichosanthes Linn.

Herbaceous climbers; *leaves* entire or palmately lobed, denticulate; tendrils usually 2–5-fid. *Flowers* diœcious, less often monœcious, white; male peduncles usually in axillary pairs, one racemose, the other 1-flowered, caducous; bracts large or small or 0; female flowers solitary. *Sepals* 5, connate in a long tube; lobes of limb lanceolate, entire or serrate or laciniate. *Petals* 5, connate at the base, margins long-fimbriate. ♂ *Stamens* 3; anthers narrow-linear, subincluded, connate, rarely (*T. dioica*) free, two 2-celled, one 1-celled, cells conduplicate. ♀ *Carpels* 3, connate in an inferior 1-celled ovary at base of calyx-tube; ovules many, horizontal, on 3 parietal placentas; style filiform; stigmatic apex 3-fid or 6-fid. *Fruit* a lanceolate or globose, smooth, acute or obtuse berry. *Seeds* many, horizontal, embedded in pulp, ellipsoid; margins sometimes angled.

Bracts of the male flowers small or none:—
  Leaves cordate-oblong, acute, sinuate-dentate, but not angled or lobed, harsh; anthers in male flowers free; both male peduncles as a rule only 1-flowered .... *dioica.*
  Leaves subreniform-cordate, usually 5-, sometimes 3–7-lobed or -angled, puberulous or pubescent; anthers in male flowers connate; earlier male peduncle (sometimes replaced by a female) 1-flowered, later one racemed:—
    Fruit ovoid-conical .... *cucumerina.*
    Fruit elongate-cylindric, sometimes contorted .... *anguina.*
Bracts of the male flowers large, wide-based, and sheathing the flowers; anthers in male flowers connate; one male peduncle (sometimes absent) 1-flowered, the other racemed; margin of leaf-blade dentate-serrate:—
  Bracts ovate or obovate, lacerate or deeply serrate; leaves palmately cut into 5, sometimes 3 or 7, broad or (rarely) narrow lobes, occasionally only 5-angled or almost entire, always glabrous beneath...*palmata.*
  Bracts narrowly obovate, entire or faintly serrate; leaves cordate-ovate or (occasionally) faintly angled, always hairy beneath ....*cordata.*

860. TRICHOSANTHES DIOICA Roxb.; F. I. iii. 701; F. B. I. ii. 609; E. D. T. 586.

In all the provinces.

A rather extensive climber. *Hind.* Palwal; *Beng.* Patol; *Uriya* Patal.

861. TRICHOSANTHES CUCUMERINA Linn.; F. I. iii. 702; F. B. I. ii. 609; E. D. T. 576.

In all the provinces; sometimes cultivated.

A considerable climber. *Beng.* Ban-chichinga; *Hind.* Jangli chachinda.

862. TRICHOSANTHES ANGUINA Linn.; F. I. iii. 701; F. B. I. ii. 610; E. D. T. 569.

Cultivated fairly generally.

A considerable climber. *Hind.* Chachinda; *Beng.* Chichinga; *Uriya* Chichendara.

863. TRICHOSANTHES PALMATA Roxb.; F. I. ii. 704; F. B. I. ii. 606; E. D. T. 600.

In all the provinces.

A large climber, stems often 30 feet long. *Hind.* Lal indrayan; *Beng.* Makal.

864. TRICHOSANTHES CORDATA Roxb.; F. I. iii. 703; F. B. I. ii. 608; E. D. T. 573.

N. Bengal; E. Bengal.

An extensive climber. *Beng.* Bhoi-kamra.

362. **Gymnopetalum** Arn.

Herbaceous climbers; *leaves* petioled, 5-angled, or deeply 5-lobed; tendrils usually simple or 2-fid. *Flowers* white, rather large, diœcious or occasionally monœcious; male peduncles in fully developed individuals 2 from each axil, the earlier 1-fld., the later long racemose, one or other often suppressed; bracts of racemed flowers large, incised, or small lanceolate; female flowers solitary, usually in separate axils if not on separate individuals. *Sepals* 5, connate in a long calyx-tube, contracted under the limb; lobes lanceolate. *Petals* 5, margins not fimbriate. ♂ *Stamens* 3; anthers included, connate, elongate, one 1-celled, two 2-celled; cells conduplicate. *Ovary* represented by 1 or 3 small linear processes. ♀ *Carpels* 3, connate in an oblong, 1-celled ovary; ovules many, horizontal, on 3 long vertical placentas; style long; stigmas three, short, linear. *Fruit* an ovate-oblong berry with acute tip and cuneate base. *Seeds* many or few, ellipsoid, compressed, margined, almost smooth.

865. GYMNOPETALUM COCHINCHINENSE Kurz; F. B. I. ii. 611. *Momordica tubiflora* F. I. iii. 711.

In most of the provinces.

A rather slender climber.

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363. Lagenaria Ser.

Large climbing herbs; *leaves* ovate or orbicular, cordate, dentate; petiole long, with 2 glands near its apex; tendrils 2-fid. *Flowers* large, white, solitary, monœcious or diœcious; males with long, females with short peduncles. *Sepals* 5, connate in a funnel-shaped or subcampanulate tube; lobes of limb narrow. *Petals* 5, obovate, free. ♂ *Stamens* 3; anthers connate, included, one 1-celled, two 2-celled, cells conduplicate. ♀ *Carpels* 3, connate in an oblong, 1-celled ovary; ovules many, horizontal, on 3 vertical placentas; style short, with three 2-fid, stigmatic lobes. *Fruit* a large, thickly coriaceous or almost woody polymorphous berry, usually broader upwards. *Seeds* numerous, horizontal, smooth with marginal groove.

866. LAGENARIA VULGARIS Ser.; F. B. I. ii. 613; E. D. L. 30.
Cucurbita Lagenaria F. I. iii. 718.
Cultivated generally.
A large climber. *Vernac.* Kaddu, kodu.

364. Luffa Cav.

Large or small climbers; *leaves* cordate, usually 5-angled or 5-lobed; petiole not glandular at apex; tendrils 2–5-fid. *Flowers* monœcious, yellow or white; males on long or short racemes or fascicled; females solitary or panicled, both sexes often from same axil. *Sepals* 5, connate in a turbinate tube, which in ♀ flowers is shortly produced beyond the ovary; lobes triangular or lanceolate. *Petals* 5, obovate. ♂ *Stamens* 3, less often 5; filaments free or connate; anthers exserted, free, one 1-celled, two 2-celled, or all 1-celled; cells sigmoid, often on the margin of the broad connective. ♀ *Carpels* 3, connate in an oblong, 1-celled ovary; ovules many, horizontal, on 3 parietal placentas; style cylindric; stigmatic lobes 3. *Fruit* a large or small, oblong, smooth or angled or spinous, fibrous berry, usually dehiscing by a circumsessile opening at the top. *Seeds* many, oblong, compressed.

*Male flowers with 5 stamens:—[p. 520]

Male pedicels axillary, clustered, without bracts; fruit small, 2 in. long, oblong, covered with papillæ, obscurely 10-striate..........*graveolens*.

Male pedicels racemed on long peduncles, each with usually a small, ovate, viscid bract; fruit large, clavate, 5–12 in. long, smooth, distinctly 10-angled or 10-ribbed ....*ægyptiaca*.

*Male flowers with only 3 stamens:—[p. 519]
Fruit medium, 3–4 in. long, 10-angled or 10-ribbed, smooth:—
  Fruit clavate, rather prominently 10-angled; endocarp when cooked bland, edible; leaves green beneath .... *acutangula.*
  Fruit oblong, 10-ribbed; endocarp when cooked acrid, cathartic and emetic; leaves pale beneath .... *amara.*
Fruit small, under 1·5 in. long, obscurely 10-striate, densely spiny and bristly .... *echinata.*

867. LUFFA GRAVEOLENS Roxb.; F. I. iii. 716; F. B. I. ii. 614.
N. Bengal; E. Bengal; Behar; Chota Nagpur.
A climber.

868. LUFFA ÆGYPTIACA Mill.; F. B. I. ii. 614; E. D. L. 569. *L. pentandra* F. I. iii. 712. *L. clavata* F. I. iii. 714. *L. racemosa* F. I. iii. 715.
Generally cultivated, but also as if wild in most of the provinces.
A very large climber. *Hind.* Ghia-taroi; *Beng.* Dhundul.

869. LUFFA ACUTANGULA Roxb.; F. I. iii. 713; F. B. I. ii. 615; E. D. L. 556.
Generally cultivated, but also as if wild in E. Bengal.
An extensive little-branched climber. *Hind.* Taroi; *Beng.* Jhinga.

870. LUFFA AMARA Roxb.; F. I. iii. 715. *L. acutangula* var. *amara* F. B. I. ii. 615; E. D. L. 563.
Chota Nagpur; Orissa.
A rather extensive, little-branched climber. *Hind.* Karui-taroi; *Beng.* Tita-jhinga.

871. LUFFA ECHINATA Roxb.; F. I. iii. 716; F. B. I. ii. 615; E. D. L. 574.
N. and E. Bengal; Tirhut.
A small climber. *Vernac.* Bindaal.

365. **Benincasa** Savi.

A large, softly hairy climber; *leaves* cordate, reniform, orbicular, more or less 5-lobed; petiole without glands. *Flowers* large, yellow, monœcious, all solitary; bracts 0. *Sepals* 5, connate in a campanulate tube below, free, leaf-like, and serrate above. *Petals* 5, slightly connate at the base, obovate. ♂ *Stamens* 3, inserted near mouth of calyx-tube; anthers exserted, one 1-celled, two

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2-celled; cells sigmoid. ♀ *Carpels* 3, connate in an oblong, densely pubescent, 1-celled ovary; ovules numerous, horizontal, on 3 parietal placentas. *Fruit* a large, fleshy, oblong, pubescent, indehiscent berry. *Seeds* many, oblong, compressed, margined.

872. BENINCASA CERIFERA Savi; F. B. I. ii. 616; E. D. B. 430. *Cucurbita Pepo* F. I. iii. 718.

Cultivated generally.

A large climber. *Beng.* Chal-kamra; *Hind.* Gol-kaddu.

366. Momordica Linn.

Herbaceous climbers; *leaves* cordate, entire, petioled; tendrils simple. *Flowers* yellow or white, monœcious or diœcious; males solitary or racemed; bracts large, small, or 0; females peduncled, solitary. *Sepals* 5, connate in a short, campanulate calyx-tube; lobes ovate. *Petals* 5, shortly connate below. ♂ *Stamens* 3, rarely 2; filaments short; anthers ultimately free, one 1-celled, two or rarely one 2-celled; cells conduplicate or rarely horseshoe-shaped. ♀ *Carpels* 3, connate in an oblong, 1-celled ovary; ovules many, horizontal, on 3 vertical placentas; style long, stigmas 3. *Fruit* an oblong or spherical, smooth or rough, many- or few-seeded berry or 3-valved capsule. *Seeds* obovate or flattened, smooth, corrugated, or sculptured.

Monœcious; bracts small near middle of slender male peduncle; fruit covered with triangular tubercles ....*Charantia*.
Diœcious; bracts large near top of male peduncle and embracing the flower:—
  Flowers yellow; fruit densely covered with soft spines; seeds ·25 in. long ....*dioica*.
  Flowers white; fruit muricated; seeds 1 in. long ......*cochinchinensis*.

873. MOMORDICA CHARANTIA Linn.; F. I. iii. 707; F. B. I. ii. 616; E. D. M. 626. *M. muricata* F. I. ii. 707.

In all the provinces; cultivated and as if wild in village shrubberies.

A slender climber. *Vernac.* Karéla.

874. MOMORDICA DIOICA Roxb.; F. I. iii. 709; F. B. I. ii. 617; E. D. M. 639.

In all the provinces.

A climber. *Santal.* Kanchan-arak'.

875. Momordica cochinchinensis Spreng.; F. B. I. ii. 618; E. D. M. 634. *M. mixta* F. I. iii. 709.

C. and E. Bengal; Chittagong.

A large climber. *Vernac.* Kakrol, gol-kakra.

367. **Cucumis** Linn.

Herbaceous, hispid or scabrous herbs; *leaves* petioled, palmately lobed or entire, dentate or serrate; tendrils simple. *Flowers* yellow, monœcious, all short-peduncled, axillary; the males fascicled, the females solitary. *Sepals* 5, connate in a turbinate or campanulate calyx-tube; lobes small. *Petals* 5, connate below in a campanulate tube; lobes oblong or ovate, acute. ♂ *Stamens* 3; anthers free, one 1-celled, two 2-celled; cells flexuose or conduplicate, connective crested. ♀ *Carpels* 3, connate in an ovoid ovary; ovules many, horizontal, on 3 vertical placentas; style short; stigmas 3, obtuse. *Fruit* a large or small, spherical or elongated, smooth or tuberculate berry. *Seeds* very many, oblong, compressed, usually smooth.

Leaves more or less harshly scabrid; fruit not tuberculate:—
  Leaves usually rather deeply 5-lobed, sometimes hardly 5-angled, never with soft hairs; fruit faintly or decidedly 3-sided, usually markedly 10-striped, ellipsoid; root capable of persisting for more than a season; not cultivated, fruit very rarely eaten ....*trigonus*.
  Leaves faintly 5-lobed, or if deeply lobed the lobes not acute, softly hairy as well as scabrid; fruit not at all 3-sided, variously spherical, ovoid, elongated, or contorted; root annual; always cultivated for its fruit..*Melo*.
Leaves hispidulous, and sometimes also softly hairy but not scabrid, 5-angular or slightly 5-lobed, the lobes acute; fruit almost always cylindric, faintly muriculate; root annual; always cultivated ....*sativus*.

876. Cucumis trigonus Roxb.; F. I. iii. 722; F. B. I. ii. 619; E. D. C. 2298. *C. turbinatus* F. I. iii. 723.

In most of the provinces.

An annual or perennial climber or creeper; not cultivated.

Sometimes considered the original source of the Melon, it may equally probably be a form of that plant which has become feral after escape.

877. Cucumis Melo Linn.; F. I. iii. 720; F. B. I. ii. 620; E. D. C. 2263. *C. utilissimus* F. I. iii. 721.

Cultivated in all the provinces.

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An annual climber or creeper. *Vernac.* Karbuz (the Sweet); Kakri (the Vegetable). The Melon.

878. CUCUMIS SATIVUS Linn.; F. I. iii. 720; F. B. I. ii. 620; E. D. C. 2287.

Cultivated in some of the provinces.

An annual climber or creeper. *Hind.* Khira; *Beng.* Sasa, khirá; *Uriya* Kaknai.

368. **Citrullus** Schrad.

Herbaceous climbers, hispid or scabrous; *leaves* petioled, palmately lobed, with usually narrow, sinuate-pinnatifid segments, sometimes lobes small; tendrils 2–3-fid. *Flowers* monœcious, all solitary, rather large. *Sepals* 5, connate in a campanulate calyx-tube. *Petals* 5, connate half-way up in a campanulate corolla with ovate-obtuse lobes. ♂ *Stamens* 3; anthers scarcely connate, one 1-celled, two 2-celled; cells conduplicate, connective not produced. ♀ *Carpels* 3, connate in an ovoid, 1-celled ovary; ovules many, horizontal, on 3 vertical placentas; style short; stigmas 3, reniform. *Fruit* a large, globose or ellipsoid, smooth, fleshy berry. *Seeds* very many, oblong, compressed, smooth.

879. CITRULLUS VULGARIS Schrad.; F. B. I. ii. 621; E. D. C. 1221.

Cucurbita Citrullus F. I. iii. 719.

Cultivated throughout our area.

An annual creeper or climber. *Vernac.* Tarbuz. The Water-Melon.

369. **Cephalandra** Schrad.

Herbaceous climbers; *leaves* petioled, palmately lobed or angled, toothed; tendrils simple. *Flowers* diœcious, rather large, solitary, white; bracts 0. *Sepals* 5, connate in a short campanulate tube; lobes obtuse or subulate. *Petals* 5, connate in a campanulate corolla; lobes short, acute. ♂ *Stamens* 3; anthers exserted, connate, one 1-celled, two 2-celled; cells conduplicate. ♀ *Carpels* 3, connate in an oblong ovary; ovules many, horizontal, on 3 vertical placentas; style long; stigmas 3, bifid. *Fruit* a smooth, fleshy, cylindric berry. *Seeds* many, ovoid, compressed, margined.

880. CEPHALANDRA INDICA Naud.; F. B. I. ii. 621; E. D. C. 919.

Momordica monadelpha F. I. iii. 708.

In all the provinces.

A rather extensive climber. *Hind.* Bhimb; *Beng.* Telakucha, bhimbu.

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370. **Cucurbita** Linn.

Large, climbing, hispid or hairy herbs; *leaves* petioled, cordate, ovate, angled or lobed; tendrils 2–4-fid. *Flowers* monœcious, all solitary, yellow, very large. *Sepals* 5, connate in a campanulate calyx-tube; lobes of limb linear or leafy. *Petals* 5, connate in a campanulate corolla; lobes short, triangular. ♂ *Stamens* 3, inserted deep in the calyx-tube; anthers connate, one 1-celled, two 2-celled; cells conduplicate. ♀ *Carpels* 3, connate in an oblong, 1-celled ovary; ovules many, horizontal, on 3 vertical placentas; style short; stigmas 3, bifid. *Fruit* a fleshy berry, often large. *Seeds* ovoid or oblong, compressed, margined or not.

Leaf-stalks beset beneath with rigid, pungent hairs; calyx-lobes narrow-subulate; leaves deeply 5-lobed, with broad sinuses between the lobes *Pepo.*

Leaf-stalks with hairs equal both beneath and above, not rigid nor pungent:—

Calyx-lobes narrow-subulate; leaves not deeply lobed, sinuses between the lobes narrow .... *maxima.*

Calyx-lobes broad-spathulate, leafy; leaves very variously lobed *moschata.*

881. CUCURBITA PEPO DC.; F. I. iii. 718; F. B. I. ii. 622; E. D. C. 2331.

Cultivated in our area.

An annual creeper or climber. *Beng.* Kumra, safed-kaddu. The Pumpkin.

882. CUCURBITA MAXIMA Duchesne; F. B. I. ii. 622; E. D. C. 2316.

Cultivated in our area.

An annual creeper or climber. *Vernac.* Mitha-kaddu. The Gourd.

883. CUCURBITA MOSCHATA Duchesne; F. B. I. ii. 622; E. D. C. 2325. *C. Melopepo* F. I. ii. 719.

Cultivated in our area.

An annual creeper or climber. *Beng.* Safra kumra. The Musk-Melon.

371. **Thladiantha** Bunge.

Herbaceous climbers; *leaves* petioled, deep-cordate, entire or 3-lobed, denticulate; tendrils simple, rarely 2-fid. *Flowers*

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diœcious, yellow, small or large; male peduncles in fully developed individuals paired, one 1-flowered, caducous, without bract, one racemed, with bracts distinct or obsolete; female peduncle elongated, 1-flowered, bract 0. *Sepals* 5, connate in a shortly campanulate calyx-tube occluded by a horizontal scale; lobes lanceolate. *Petals* 5, connate below in a campanulate tube, upper half of petals free, revolute. ♂ *Stamens* 5, four approximated in 2 pairs; filaments free, subulate; anthers straight, narrow, oblong, 1-celled. ♀ *Carpels* 3, connate in an oblong ovary; ovules many, horizontal, on 3 vertical placentas; style deeply 3-fid, with 3 reniform stigmas. *Fruit* an ellipsoid, obtuse, green, subcylindric, vertically ribbed berry. *Seeds* many, small, obovoid, compressed, smooth.

884. THLADIANTHA CALCARATA C. B. Clarke. *T. dubia* F. B. I. ii. 631.

E. Bengal; Chittagong.

A large climber.

372. Mukia Arn.

Herbaceous, scabrid climbers; *leaves* palmately nerved, cordate, angled but not deeply lobed, petioled and sessile on same individual; tendrils simple. *Flowers* small, yellow, monœcious, in axillary clusters; males short-peduncled, females sessile in same axil. *Sepals* 5, connate in a campanulate calyx; lobes subulate. *Petals* 5, connate in a 5-partite corolla. ♂ *Stamens* 3, inserted deep in the calyx-tube; anthers free, two 2-celled, one 1-celled; cells straight, connective not produced. ♀ *Carpels* 2 or 3, connate in a 1-celled, ovoid, hispid ovary, with an annular disk; ovules few, horizontal, on 2–3 vertical placentas; style thick, its apex with 2–3 stigmatic lobes. *Fruit* a small, globose berry. *Seeds* few, ovoid, compressed, strongly margined.

885. MUKIA SCABRELLA Arn.; F. B. I, ii. 623; E. D. M. 791. *Bryonia scabrella* F. I. iii. 724.

In all the provinces.

A slender scabrid climber. *Vernac.* Bilari.

373. Bryonia Linn.

Herbaceous climbers; *leaves* petioled, palmately lobed or angled; tendrils 2-fid. *Flowers* small, yellowish, monœcious; males and females clustered, short-pedicelled, in same axil. *Sepals* 5, connate in a widely campanulate calyx; lobes of limb small. *Petals* 5, connate in a 5-partite corolla. ♂ *Stamens* 3, inserted deep in the calyx-tube; anthers free, one 1-celled, two 2-celled; cells curved or sigmoid, not conduplicate, connective not produced. ♀ *Carpels* 3, connate in an ovoid, 1-celled ovary; ovules many, horizontal, on 3 parietal placentas; style slender, 3-fid at the apex. *Fruit* a globose berry. *Seeds* rather few, oblong or ovoid, compressed.

886. BRYONIA LACINIOSA Linn.; F. I. iii. 728; F. B. I. ii. 622; E. D. B. 904.

In all the provinces.

A slender, nearly glabrous climber. *Hind.* Gargu-naru; *Beng.* Mala.

374. Melothria Linn.

Herbaceous climbers; *leaves* deltoid, truncate or hastate, entire or 3-lobed, often punctate, petioled; tendrils simple or 2-fid. *Flowers* small, white, monœcious or, rarely, diœcious, males and females often in the same axil; male pedicels long, fascicled, or rarely subsolitary, or racemed on leafless branches; females long-pedicelled. *Sepals* 5, connate in a short calyx-tube; lobes of limb small. *Petals* 5, connate in a 5-partite corolla. ♂ *Stamens* 3, inserted in middle of calyx-tube; anthers free, two 2-celled, one 1-celled; cells straight, simple, sublateral, connective produced. ♀ *Carpels* 3, connate in an oblong, 1-celled ovary; ovules many, horizontal, on 3 vertical placentas; style long; stigmas 3, subglobose. *Fruit* a globose or fusiform, somewhat beaked berry. *Seeds* numerous, small, oblong, much compressed, obscurely margined.

Male flowers clustered in the leaf-axils; fruit ellipsoid, pointed ...*indica*.
Male flowers in distant clusters on long racemes; fruit globose, subquadrate, obtuse:—
  Leaves entire or slightly 3-lobed ....*leucocarpa*.
  Leaves deeply cut into long, narrow, divaricate lobes *leucocarpa* var. *triloba*.

887. MELOTHRIA INDICA Lour.; F. B. I. ii. 626. *Bryonia tenella* F. I. iii. 725.

E. Bengal; Chittagong.

A slender climber.

888. MELOTHRIA LEUCOCARPA Cogn. *M. odorata* F. B. I. ii. 626.

E. Bengal.

A climber.

888/2. Var. TRILOBA F. B. I. ii. 626.
E. Bengal.
A climber.

375. Zehneria Endl.

Herbaceous climbers; *leaves* petioled, petioles short or long, lamina polymorphous, toothed, angled, or deeply lobed; tendrils simple. *Flowers* small, yellowish, monœcious or diœcious; males in peduncled corymbs; females short-peduncled, solitary, or less often subcorymbose; bracts small or obsolete. *Sepals* 5, connate in a tubular calyx; lobes of limb small. *Petals* 5, triangular, connate only at the base. ♂ *Stamens* 3, inserted deep in the calyx-tube; filaments glabrous or pubescent; anthers free, all 2-celled, or two 2-celled and one 1-celled; cells curved or sigmoid, connective often papillose at top. ♀ *Carpels* 3, connate in a globose or oblong, glabrous or hairy, 1-celled ovary; ovules many, horizontal, on 3 vertical placentas; style cylindric, its base surrounded by an annular disk, its stigmatic apex 3-lobed. *Fruit* a globose, ellipsoid, or cylindric succulent berry.

Petiole longer than the auricles at base of leaf-blade; fruit globose, reticulate, rugose when dry ....*Hookeriana*.
Petiole usually shorter than the auricles; fruit cylindric, not rugose *umbellata*.

889. ZEHNERIA HOOKERIANA Arn.; F. B. I. ii. 624.
Chittagong.
A weak climber.

890. ZEHNERIA UMBELLATA Thwaites; F. B. I. ii. 625; E. D. Z. 182. *Momordica umbellata* F. I. iii. 710.
In every province.
A climber. *Beng.* Kudari; *Hind.* Tarali; *Santal.* At'.

376. Actinostemma Griff.

A weak herbaceous climber; *leaves* petioled, deep-cordate or hastate, elongate, much-toothed; tendrils simple and 2-fid. *Flowers* small, monœcious, in lax axillary panicles, mostly male, the females few near the base of the peduncle. *Sepals* 5, connate in a small, rotate calyx; lobes linear-lanceolate. *Petals* 5, caudate-lanceolate, connate at the base. ♂ *Stamens* 5, free, their connectives dilated, papillose on one side, with a straight, oblong, single anther-cell on the other. ♀ *Carpels* 2, connate in a subglobose, verrucose, 1-celled ovary; ovules 2 or 4, pendulous from two short, parietal placentas near apex of ovary; style short; stigmas 2, reniform. *Fruit* a small, ovoid-conical, half-superior capsule, covered with rough points, circumscissile above the middle. *Seeds* 2–4, ovate, corrugated and denticulate on the margin.

891. ACTINOSTEMMA TENERUM Griff.; F. B. I. ii. 633.
E. Bengal.
A weak climber.

377. Gynostemma Bl.

A herbaceous climber; *leaves* pedate, segments 3–5, ovate-lanceolate, serrate; tendrils simple. *Flowers* small, diœcious, greenish, in diffuse axillary panicles. *Sepals* 5, connate in a short tube; lobes small. *Petals* 5, connate in a rotate corolla, segments lanceolate. ♂ *Stamens* 5; filaments connate below; anthers 2-celled; cells long, straight. ♀ *Carpels* 2–3, connate in a spherical, 2–3-celled ovary; ovules in each cell 2, pendulous; styles 2 or 3, connate below, each 2-fid at tip. *Fruit* a fusiform, umbonate, or globose, 1–3-seeded berry. *Seeds* verrucose.

892. GYNOSTEMMA PEDATUM Bl.; F. B. I. ii. 633.
N. Bengal, in the Duars.
A slender climber.

Order LXII. BEGONIACEÆ.

Herbs or undershrubs, usually succulent; stem often a creeping rhizome or corm. *Leaves* alternate, rarely pseudo-verticillate, more or less inequilateral, lobed or toothed or entire; stipules 2, free, often deciduous. *Flowers* unsymmetrical, 1-sexual, monœcious, on axillary, dichotomously cymosely divided peduncles with branchlets and basal bracts usually opposite; generally showy, white, rose or yellow, sometimes small. *Disk* 0. ♂ *Sepals* and *petals* forming a 2-seriate perianth; outer segments usually 2, opposite, valvate; inner segments smaller, usually 2, imbricate or 0. *Stamens* numerous, free or connate in one phalanx; anthers narrowly obovoid, 2-celled; cells adnate; dehiscence longitudinal, introrse. ♀ *Perianth* of 2–6 segments. *Ovary* inferior, 2–3–4-locular or 1-locular, usually 3-locular and 3-cornered or winged, placentas axial simple, or 2-lamellate and intruded into the loculus; styles 2–4, free or connate below; stigmas branched or

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tortuous; ovules numerous, often covering the whole placental surface, anatropous. *Fruit* a loculicidal, rarely septicidal, or irregularly rupturing capsule, less often succulent, often winged. *Seeds* numerous, minute, globose or narrowly cylindric; testa reticulate; albumen scanty or 0; embryo obovoid or subcylindric with minute cotyledons.

378. **Begonia** Linn.

Herbs, rarely shrubs; *leaves* unequal-sided, entire or lobed, irregularly toothed. *Flowers* often showy, monœcious. ♂ *Perianth* of 2 outer sepaloid and 2 inner petaloid segments, rarely more, very rarely 0. *Stamens* many; filaments free or monadelphous. ♀ *Perianth* usually of 5 segments, the 2 outer rather larger and sepaloid. *Carpels* usually 3, rarely 2 or 4–5, connate in a 2–5-locular ovary; styles usually as many as the ovarian cells, free or connate at the base, 2-fid at apex, with entire or incised lobes; ovules on axial, rarely on parietal placentas. *Fruit* usually a 3-cornered or unequally 3-winged capsule, rarely round or 4-angled, sometimes berry-like, 2–5-locular; dehiscence septicidal or loculicidal, partial or complete, occasionally irregular. *Seeds* many, small.

Capsule 3-celled, 3-angled, the angles produced into three unequal, papery wings, the flat faces ribbed down the middle ....*picta*.
Capsule 2-celled, compressed, 3-angled, two angles produced into equal narrow wings, the third into a broader wing..........................*barbata*.

893. Begonia picta Sm.; F. B. I. ii. 638.
Chota Nagpur.
A herb.

894. Begonia barbata Wall.; F. B. I. ii. 646.
Chittagong.
A tall herb.

Order LXIII. DATISCEÆ.

Trees or herbs. *Leaves* petioled, simple or pinnate; stipules 0. *Flowers* small, diœcious, rarely 2-sexual or polygamous, in clusters, racemes, or panicles. ♂ *Sepals* connate in a small calyx with short tube and 3–9 equal or unequal teeth. *Petals* 0. *Stamens* 4–more, opposite the calyx-lobes; filaments short; anthers 2-celled; dehiscence longitudinal, lateral, or extrorse; rudimen-

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tary *ovary* 0 or minute. ♀ *Sepals* connate in a calyx, with tube adnate to ovary; lobes 3–8, short. *Petals* 0. *Stamens*, if present, as in ♂, more often reduced to staminodes or 0. *Ovary* 1-locular, open or closed at the apex; placentas parietal, alternating with calyx-lobes; styles lateral, as many as placentas, 2-partite or simple; ovules numerous, ascending or horizontal, anatropous. *Fruit* a coriaceous or membranous capsule, opening at the apex between the styles. *Seeds* numerous, small; albumen scanty; embryo axial, straight, cylindric.

379. Tetrameles R.Br.

A large tree; *leaves* petioled, ovate, more or less pubescent beneath. *Flowers* diœcious, appearing before the leaves; males panicled; females racemose; clustered near ends of branchlets. ♂ *Sepals* 4, ovate, connate in a campanulate tube, sometimes accessory lobes present. *Petals* 0. *Stamens* 4, opposite the calyx-lobes, inserted round a depressed disk, within which is occasionally a quadrangular rudimentary ovary. ♀ *Sepals* 4, connate in an ovoid calyx-tube with short lobes. *Petals* 0. *Carpels* 4, connate in a 4-lobed ovary with intruded apex; ovules 3–4-seriate on 4 parietal placentas; styles 4, short; stigmas simple, subclavate. *Fruit* a small, ovoid, faintly 4-ridged, membranous capsule, opening at the apex between the styles. *Seeds* minute, numerous, flattened, ellipsoid, with a loose, lax, reticulate testa.

895. TETRAMELES NUDIFLORA R.Br.; F. B. I. ii. 657; E. D. T. 372.

N. Bengal, Duars; Chittagong.

A lofty tree, 100–150 feet high. *Vernac.* Sandúgaza; maina-kát.

Order LXIV. CACTACEÆ.

Herbs, shrubs, or trees, with usually succulent stems; branches often thickened, striated or angled. *Leaves* usually represented by tufts of spines or by prickles or small tubercles; stipules 0. *Flowers* regular, hermaphrodite, solitary. *Sepals* united in a calyx, with tube adnate to ovary and with 3–many small, imbricate lobes. *Petals* many, free or shortly connate below, imbricate. *Stamens* numerous, free, or adnate to the base of the petals; filaments filiform; anthers small, oblong, dehiscing in front. *Ovary* free or embedded in the stem, 1-locular; placentas many, parietal;

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style terminal, simple, filiform or cylindric; stigma 2–many-rayed; ovules numerous on each placenta, horizontal, anatropous. *Fruit* a 1-celled berry with pulpy placentas. *Seeds* very many, oblong or reniform; testa hard, black; albumen scanty, copious, or 0; embryo straight or curved; cotyledons free or connate.

380. **Opuntia** Mill.

Shrubs, with rounded woody base; branches jointed, joints fleshy, flattened, ovate, tubercled, the tubercles hirsute and spiny, the youngest joints with small, scale-like, deciduous leaflets. *Flowers* lateral, yellow, or purplish. *Sepals* many, the outermost scale-like or leafy, adnate to ovary, the inner short, flat, all connate in a tubular calyx, not produced beyond the ovary. *Petals* many, spreading, connate below. *Stamens* very numerous, many-seriate; filaments shorter than petals, free or more or less connate. *Carpels* several, connate in a glabrous, exserted ovary; ovules many, on parietal placentas; style cylindric, hardly exceeding the stamens, thickened below, hollow above; stigmatic rays thick, erect, several. *Fruit* a pear-shaped, umbilicate, tubercled berry. *Seeds* compressed; testa very hard, albuminous; cotyledons leaf-like.

896. OPUNTIA DILLENII Haw.; F. B. I. ii. 657; E. D. O. 193. *Cactus indicus* F. I. ii. 475.

Behar; W. Bengal; Chota Nagpur; Orissa.

A spiny shrub with flattened, articulated, fleshy stems. *Vernac.* Nág-phana.

Order LXV. FICOIDEÆ.

Herbs. *Leaves* simple, often fleshy, usually opposite or whorled; stipules scarious or 0. *Flowers* regular, hermaphrodite rarely polygamous, in cymes or fascicles, rarely solitary. *Sepals* 4–5, shortly connate below or almost distinct, occasionally adnate below to the ovary but usually free, often persistent. *Petals* usually very small, white, or 0. *Stamens* perigynous or hypogynous, definite or indefinite, sometimes accompanied by staminodes, if as many as sepals opposite to them, if more sometimes connate in bundles; anthers oblong, 2-celled; dehiscence longitudinal, introrse. *Carpels* 2–5, connate, very rarely free, superior, very rarely inferior; styles as many as carpels, free or connate below; stigmas usually subulate, introrse; ovules amphitropous, either solitary basal, or many axial in each carpel or loculus. *Fruit* usually capsular, with dehiscence dorsal or circumscissile, less often of separating, indehiscent cocci, or of free, indehiscent carpels. *Seeds* 1–many in each carpel, usually reniform, compressed; albumen mealy, embraced by the curved or annular embryo.

Calyx-tube elongated; stamens inserted on the tube; capsule with dehiscence circumscissile:—
  Ovary and capsule 3–5-celled ....**Sesuvium.**
  Ovary and capsule 1–2-celled ....**Trianthema.**
Calyx deeply 5-partite; stamens hypogynous; capsule with dorsal dehiscence; ovary and capsule 3–5-celled ....**Mollugo.**

381. **Sesuvium** Linn.

Succulent, branching, prostrate, littoral herbs; *leaves* opposite, fleshy; stipules 0. *Flowers* axillary, purplish; bracts 2 or 0. *Sepals* 5, connate in a short calyx-tube; lobes of limb triangular, lanceolate, persistent. *Petals* 0. *Stamens* 5 or many, inserted round apex of calyx-tube. *Carpels* 3–5, connate in a superior, 3–5-celled ovary; ovules in each cell many, axial; styles 3–5, papillose within. *Fruit* an ovate-oblong, membranous, 3–5-celled, circumscissile capsule. *Seeds* in each cell many, reniform; embryo annular.

897. SESUVIUM PORTULACASTRUM Linn.; F. I. ii. 509; F. B. I. ii. 659; E. D. S. 1203.

Sundribuns.

A seashore creeping herb.

382. **Trianthema** Linn.

Diffuse, prostrate, branching, glabrous or papillose herbs; *leaves* petioled, opposite, unequal, entire; petioles connected at their base by membranous dilatations. *Flowers* small, axillary, solitary, sessile or peduncled, or in clusters or small cymes; bracteoles 2. *Sepals* 5, connate in a short or long calyx-tube; lobes often cuspidate. *Petals* 0. *Stamens* 5, 10, or 15, inserted near top of calyx-tube. *Carpels* solitary, or 2 connate in a 2-celled, superior ovary; styles subulate, 1 or 2, excentric, papillose within; ovules 1 or more in each carpel, arising from a basal placenta.

Fruit a membranous or coriaceous, clavate, circumscissile capsule. *Seeds* 1 or more, reniform; embryo annular.

898. TRIANTHEMA MONOGYNUM Linn.; F. B. I. ii. 660; E. D. T. 537. *T. obcordata* F. I. ii. 445.

Chota Nagpur; C. and E. Bengal.

A diffuse, glabrous herb. *Vernac.* Gada-bani; labuni.

383. **Mollugo** Linn.

Branching, often dichotomous herbs; *leaves* often falsely whorled or alternate, or radical rosulate, entire, linear to obovate; stipules caducous. *Flowers* small, greenish, axillary, sessile or pedicelled, clustered or in cymes or racemes; bracts minute. *Sepals* 5, persistent. *Petals* 0. *Stamens* 3–5, sometimes many, often with staminodes intermixed. *Carpels* 3–5, connate in an ovoid or globose, 3–5-celled ovary; ovules many in each cell, axial; styles 3–5, linear or small clavate. *Fruit* a membranous, oblong, globose, or subcylindric capsule, sheathed by the calyx; dehiscence loculicidal. *Seeds* several in each cell, rarely solitary, reniform; embryo annular.

Inflorescence in compound terminal cymes; seeds not appendaged at the hilum; leaves and stem glabrous ....*stricta*.
Inflorescence in axillary clusters; seeds with an appendage at the hilum:—
  Glabrous or almost glabrous; flowers pedicelled; seeds with a short, subulate bristle at hilum ....*Spergula*.
  Stellately woolly or hairy; flowers sessile; seeds with a membranous scale, which emits a long, curved bristle..............................*hirta*.

899. MOLLUGO STRICTA Linn.; F. B. I. ii. 663; E. D. M. 617. *M. triphylla* F. I. i. 360. *M. pentaphylla* F. I. i. 360.

In all the provinces.

A suberect herb. *Uriya* Pita-gohun; *Beng.* Khet-papara.

900. MOLLUGO SPERGULA Linn.; F. B. I. ii. 662. *M. verticillata* F. I. i. 360. *Pharnaceum Mollugo* F. I. ii. 102.

In all the provinces.

A diffuse leafy herb.

901. MOLLUGO HIRTA Thunb.; F. B. I. ii. 662; E. D. M. 615. *Pharnaceum pentagonum* F. I. ii. 103.

In all the provinces.

A prostrate herb.

Order LXVI. UMBELLIFERÆ.

Herbs, rarely shrubs or trees. *Leaves* alternate, usually divided or dissected, sometimes simple; petiole generally sheathing at base; stipules 0. *Flowers* regular or irregular, hermaphrodite or polygamous, in compound, rarely simple umbels, the peripheral flowers sometimes ray-like; bracts at base of general, and bracteoles at base of secondary umbels involucrately whorled. *Disk* epigynous, distinct from stamens and petals, variously 2-lobed. *Sepals* connate in a tube adnate to ovary; limb 5-toothed or 0. *Petals* 5, epigynous, often unequal, with a median fold on the upper side, with the margin often incurved or 2-lobed, imbricate or reduplicate-valvate in bud. *Stamens* 5, epigynous; anthers versatile; dehiscence longitudinal, lateral. *Ovary* inferior, 2-celled, crowned by the disk: styles 2; stigmas capitellate; ovules in each cell solitary, pendulous, anatropous. *Fruit* of 2 indehiscent, dorsally or laterally compressed ripe carpels (mericarps) separated by a commissure; carpels each attached to and often pendulous from a slender forked axis (carpophore), with 5 primary ridges (1 dorsal, 2 marginal, and 2 intermediate) and often 4 intercalated secondary; pericarp often traversed by oil-canals (vittæ). *Seed* solitary in each carpel, pendulous; albumen cartilaginous; embryo minute, near hilum

- Umbels simple; fruit not vittate; leaves simple ....**Hydrocotyle.**
- Umbels compound; fruit usually vittate:—
  - Leaves simple; flowers yellow; secondary ridges of fruit inconspicuous **Bupleurum.**
  - Leaves variously compound:—
    - *Secondary ridges of the fruit inconspicuous:—[p. 535]
      - †Primary ridges of the fruit not winged:—[p. 535]
        - Fruit laterally compressed, or at least constricted at the commissure; ridges of the fruit slender:—
          - Furrows of the fruit 1-vittate..............................**Carum.**
          - Furrows of the fruit 2-3-vittate......................**Pimpinella.**
        - Fruit in cross-section circular, or somewhat dorsally compressed and widest at the commissure; furrows of the fruit 1-vittate:—
          - ‡Flowers yellow; leaves cut into filiform segments; carpophore distinct, 2-partite; calyx-teeth 0 [p. 535] ....**Fœniculum.**

‡Flowers white or pink-tinged:—[p. 534]

Lateral primary ridges hardly wider than dorsal; carpophore distinct, 2-partite or not; calyx-teeth 0.........**Seseli.**

Lateral primary ridges thick, triangular, corky, much exceeding dorsal; carpophore 0; calyx-teeth small, acute **Œnanthe.**

†Primary lateral ridges of the fruit excurrent, winged; fruit much dorsally compressed, the wings of the opposing carpels closely applied face to face [p. 534]..................................**Peucedanum.**

*Secondary ridges of the fruit prominent; fruit subterete, not winged:—[p. 534]

Fruits glabrous, secondary ridges broad, very blunt; involucre of bracts none ....**Coriandrum.**

Fruits hirsute, secondary ridges bristly; bracts of involucre numerous, pinnate ....**Daucus.**

384. Hydrocotyle Linn.

Prostrate herbs, rooting at the nodes; *leaves* cordate or hastate (in Indian species), round or angled, subentire or palmately lobed, long-petioled; stipules small, scarious. *Flowers* white, sometimes 1-sexual, in small, simple umbels; bracts small or 0. *Sepals* quite connate in a calyx with 5 small teeth or with limb entire. *Petals* 5, entire, valvate or imbricate. *Stamens* 5. *Carpels* 2, connate in an inferior ovary. *Fruit* laterally compressed, commissure narrow; carpels laterally compressed or 5-angled; lateral primary ridges concealed within the commissure or remote from it and prominent; vittæ 0 or obscure; carpophore 0. *Seed* laterally compressed.

Petals acute, valvate; secondary ridges of fruit 0; pericarp not thickened; leaves orbicular-cordate, ·25–1 in. across ....*rotundifolia.*

Petals obtuse, imbricate; secondary ridges as distinct as primary; pericarp much thickened; leaves orbicular-reniform, ·5–2·5 in. across *asiatica.*

902. HYDROCOTYLE ROTUNDIFOLIA Roxb.; F. I. ii. 88; F. B. I. ii. 668.

N. Bengal; C. Bengal.

A prostrate herb.

903. HYDROCOTYLE ASIATICA Linn.; F. I. ii. 88; F. B. I. ii. 669; E. D. H. 486.

In all the provinces.

A prostrate herb. *Vernac.* Brahmamanduki.

385. Bupleurum Linn.

Glabrous herbs or shrubs; *leaves* entire. *Flowers* yellow or lurid, pedicelled or subsessile; umbels compound; bracts and bracteoles foliaceous or setaceous or obsolete. *Sepals* connate in a calyx-tube with entire limb. *Petals* 5, obovate, emarginate. *Stamens* 5. *Carpels* 2, connate in an inferior ovary; styles short. *Fruit* subpentagonal; primary ridges distinct, sometimes almost winged, rarely obscure; secondary 0, or obscure; vittæ 1–3 between the primary ridges, rarely 0 or more than three; carpophore entire or 2-fid or 2-partite; disk depressed, rarely prominent in fruit. *Seed* terete, sometimes slightly grooved on the inner face.

904. BUPLEURUM MUCRONATUM W. & A.; F. B. I. ii. 676.
Chota Nagpur, Sirguja.
A herb, 7 feet high, with yellow flowers.

386. Carum Linn.

Perennial or annual herbs; *leaves* pinnate or decompound. *Flowers* white, polygamous, the sterile flowers often with enlarged or irregular petals; umbels compound; bracts few or many, simple or rarely divided; bracteoles several or many, entire. *Sepals* connate in a calyx-tube with teeth small or 0. *Petals* 5, retuse or emarginate. *Stamens* 5. *Carpels* 2, connate. *Fruit* ovoid, ellipsoid or oblong, laterally compressed and more or less constricted at the commissure; carpels terete, subpentagonal, the inner face flattened; primary ridges slender, conspicuous, or obsolete, lateral commissural; furrows 1-vittate; carpophore 2-fid or 2-partite. *Seed* terete, subcompressed dorsally, flat or obscurely channelled on the inner face.

Leaves ternately cut; lobes of the lower stem-leaves oblong-linear; fruit hispid; bracteoles 4–8, lanceolate, margins ciliate ......*Roxburghianum*.
Leaves decompound; lobes of all the leaves linear-setaceous; fruit muriculate; bracteoles 3–5, small, linear ....*copticum*.

905. CARUM ROXBURGHIANUM Benth.; F. B. I. ii. 682; E. D. C. 701. *Apium involucratum* F. I. ii. 97.
Cultivated in all the provinces.
A field-crop, of herbs 1–3 feet high. *Beng.* Chanu, rajani; *Hind.* Ajmud.

906. CARUM COPTICUM Benth.; F. B. I. ii. 682; E. D. C. 691. *Ligusticum Ajouan* F. I. ii. 91.

Cultivated in most of the provinces.

A field-crop, of herbs 1–3 feet high. *Hind.* Ajouan; *Beng.* Jurani.

387. **Pimpinella** Linn.

Biennial or perennial herbs; *leaves* once or twice pinnate or ternate, rarely simple and toothed. *Flowers* hermaphrodite or polygamo-monœcious; umbels compound; bracts few or 0; bracteoles usually linear, sometimes obsolete. *Sepals* connate in a calyx-tube with 5 linear teeth. *Petals* 5, usually emarginate, ovate-acute or lanceolate-caudate. *Stamens* 5. *Carpels* 2; styles usually long, rarely very short. *Fruit* laterally compressed, usually constricted at the commissure, ovate, ovate-oblong or narrowly oblong; carpels terete or subpentagonal, often dorsally compressed, inner face flattened; ridges slender, obscure or prominent; furrows 2–3-, very rarely 1-vittate; carpophore entire or 2-fid or 2-partite. *Seed* terete, semi-terete, or dorsally compressed; inner face almost or quite flat.

907. PIMPINELLA HEYNEANA Wall.; F. B. I. ii. 684. *Anethum trifoliatum* F. I. ii. 96.

Chota Nagpur; Chittagong.

A herb, 2–4 feet high, leaves 1–3 times 3-partite.

388. **Fœniculum** Adans.

Tall biennial or perennial glabrous herbs; *leaves* 2–3–4 times pinnate, the ultimate segments linear or setaceous. *Flowers* yellow; umbels compound; bracts 0; bracteoles 0, or few linear. *Sepals* connate in a calyx with entire limb. *Petals* 5, emarginate. *Stamens* 5. *Carpels* 2; styles short. *Fruit* oblong or ellipsoid, not compressed laterally; carpels semi-terete; ridges subequal, prominent; furrows 1-vittate; carpophore 2-partite. *Seed* somewhat compressed dorsally; face slightly concave.

908. FŒNICULUM VULGARE Gaertn.; F. B. I. ii. 695; E. D. F. 659. *Anethum Panmorium* F. I. ii. 94.

Occasionally cultivated in the western provinces.

A tall glabrous herb. *Hind.* Saunf; *Beng.* Pan-mohuri. Fennel.

389. **Seseli** Linn.

Herbs, glabrous or pubescent; *leaves* twice or thrice pinnate, or twice 3-partite. *Flowers* white; umbels compound; bracts 0 or few, rarely many; bracteoles several or many. *Sepals* connate in a calyx-tube; limb entire or with 5 minute, lanceolate or linear teeth. *Petals* 5, emarginate. *Stamens* 5. *Carpels* 2; styles usually short. *Fruit* oblong, ovate, or orbicular, not laterally compressed, broadest at the commissure; carpels semi-terete or occasionally much compressed dorsally; inner face flat or occasionally concave; ridges strong, obtuse or subacute, lateral hardly larger than dorsal; vittæ solitary, usually prominent, in each furrow; carpophore 2-partite or 2-fid, less often entire; disk not prominent on the fruit. *Seed* semi-terete or occasionally dorsally compressed; inner face concave.

Lower leaves twice pinnate, secondary pinnæ ovate, lobed, pubescent, ultimate leaf-segments never linear; bracts narrow, lanceolate, caudate, pubescent; fruit usually pubescent to hirsute, subglobose.........*indicum*.
Lower leaves often thrice pinnate, ultimate segments linear or narrowly lanceolate, glabrous; bracts sometimes pinnate, glabrous; fruit globose, glabrous..*daucifolium*.

909. SESELI INDICUM W. & A.; F. B. I. ii. 693; E. D. S. 1201.
Ligusticum diffusum F. I. ii. 92.
In all the provinces.
An annual much-branched herb. *Beng.* Ban-jowan.

910. SESELI DAUCIFOLIUM C. B. Clarke; F. B. I. ii. 693.
E. Bengal; Chittagong.
An annual erect herb.

390. **Œnanthe** Linn.

Herbs of marshy ground; roots fibrous, creeping or stoloniferous; *leaves* 1–3-pinnate, ultimate segments large or small, linear or minute, occasionally leaves reduced almost to the sheaths. *Flowers* white, often polygamous; male flowers sometimes irregular or enlarged; umbels compound; bracts 0 or solitary; bracteoles several, linear. *Sepals* connate in a calyx-tube; limb with small, acute teeth. *Petals* 5, emarginate. *Stamens* 5. *Carpels* 2, connate; styles short. *Fruit* glabrous, ellipsoid, longer than broad, or globose, nearly terete; commissure broad; carpels semi-terete, dorsally compressed, inner face flattened; lateral primary ridges large, triangular, corky; dorsal and intermediate primary ridges smaller or obsolete or all subequal; furrows 1-vittate; carpophore 0; disk not usually prominent. *Seed* terete or dorsally compressed, with flattened inner face.

Leaves pinnate, rarely 2-pinnate; stem long, decumbent, often floating, emitting stolons from its base; umbels on very long peduncles *stolonifera.*

Leaves pinnately decompound; stem erect; umbels on very short peduncles or almost sessile ....*benghalensis.*

911. ŒNANTHE STOLONIFERA Wall.; F. B. I. ii. 696. *Phellandrium stoloniferum* F. I. ii. 93.

C. and E. Bengal.

A herb of wet places. *Beng.* Pan-turasi.

912. ŒNANTHE BENGHALENSIS Benth.; F. B. I. ii. 696. *Seseli benghalensis* F. I. ii. 94.

N. C. and E. Bengal.

A herb of ditch-sides and banks of tanks.

391. **Peucedanum** Linn.

Perennial herbs; *leaves* 1–3-pinnate or 2–3 times 3-partite, ultimate segments lanceolate or ovate, rarely linear, toothed or entire. *Flowers* yellow, white, or rarely pink, often polygamous; umbels compound with usually many rays; bracts various; bracteoles few or many, sometimes wanting. *Sepals* connate in a calyx, with subentire or entire limb. *Petals* 5, obovate, emarginate or 2-fid. *Stamens* 5. *Carpels* 2, connate in a glabrous ovary. *Fruit* much compressed dorsally, ellipsoid, oblong or orbicular; carpels hardly convex on the back, their margins more or less acutely winged; lateral ridges winged, but dorsal and marginal ridges obscure or obsolete; dorsal furrows 1-vittate; margin 1-vittate or occasionally 2-vittate. *Seed* much compressed dorsally; inner face flat.

Ultimate leaf-segments filiform; fruit small, narrowly winged; furrows all 1-vittate; commissure 2-vittate ....*Sowa.*

Ultimate leaf-segments expanded (lanceolate to ovate); fruit large, much compressed, wide-winged:—

Fruit subquadrate; dorsal furrows 1-vittate, lateral 2-vittate; commissure 4- or more-vittate; leaf-segments oblong, ovate, or (rarely) suborbicular ....*Dhana.*

Fruit obovate; dorsal and lateral furrows alike 1-vittate; commissure evittate; leaf-segments of lower leaves ovate-acute, of upper linear *nagpurensis.*

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913. Peucedanum Sowa Kurz. *P. graveolens* F. B. I. ii. 709; E. D. p. 460. *Anethum Sowa* F. I. ii. 94.
Generally cultivated.
A glabrous herb, 1–3 feet high. *Hind.* Sowa; *Beng.* Salpha, sowa.

914. Peucedanum Dhana Ham.; F. B. I. ii. 709.
N. Bengal; Chota Nagpur.
A glabrous herb, 6 in. to 2 feet high.

915. Peucedanum nagpurensis Prain. *P. glaucum* var. ? *nagpurensis* F. B. I. ii. 710.
Behar; W. Bengal; Chota Nagpur.
A tall herb, 5–7 feet high. *Vernac.* Tej raj.

392. Coriandrum Linn.

An annual, branched, glabrous herb; *leaves* decompound. *Flowers* white or purple, the outermost irregular; umbels compound, rays few; bracts 0, or small and linear; bracteoles filiform, few. *Sepals* connate in a calyx-tube; limb with small, acute, often unequal teeth. *Petals* 5, obovate, emarginate. *Stamens* 5. *Carpels* 2, connate. *Fruit* subglobose; ridges not prominent, dorsal primary and adjacent secondary strongest, lateral primary and secondary obscure; vittæ solitary, under the secondary ridges, obscure; commissure distinctly 2-vittate; carpophore 2-partite. *Seed* convex dorsally, with concave face, almost three times as broad as thick.

916. Coriandrum sativum Linn.; F. I. ii. 94; F. B. I. ii. 717; E. D. c. 1954.
Cultivated in the northern and western provinces.
An annual glabrous herb. *Hind.* Dhaniya; *Beng.* Dhane.

393. Daucus Linn.

Annual or biennial, usually hispid herbs; *leaves* 2–4-pinnate, ultimate segments small or narrow. *Flowers* white, outer often irregular; umbels compound, rays usually many; bracts pinnate, usually many; bracteoles many, entire or 3-fid, sometimes obsolete. *Sepals* connate in a calyx-tube; teeth of limb small or obsolete. *Petals* 5, obovate, emarginate. *Stamens* 5. *Carpels* 2, connate. *Fruit* elliptic, terete, or somewhat compressed dorsally; ridges all prominent, all or only the secondary bristly; lateral primary little developed; lateral secondary the widest; vittæ solitary under the secondary ridges; carpophore entire or 2-fid. *Seed* semi-terete, dorsally subcompressed; inner face flattened.

917. Daucus Carota Linn.; F. I. ii. 90; F. B. I. ii. 718.

Cultivated, especially in the western parts.

A herb, stem 1–4 feet high. *Vernac.* Gájar. The Carrot.

Order LXVII. ARALIACEÆ.

Trees or shrubs, rarely herbs, sometimes scandent, or at first scandent, at length rigid, frequently armed with prickles. *Leaves* alternate, or the upper sometimes subopposite, long-petioled, large, simple or compound; stipules adnate to petiole, sometimes indistinguishable from its sheathing base, or 0. *Flowers* regular, hermaphrodite or polygamous, rarely diœcious, small, in umbels, racemes, or panicled heads; bracts and bracteoles small or inconspicuous; pedicels continuous with calyx-base, or jointed. *Disk* epigynous, variously crenated. *Sepals* connate in a tube, adnate to ovary; limb truncate or with small teeth or obsolete. *Petals* 5, rarely 6–7, or many, valvate or subimbricate, separating or deciduously calyptrate. *Stamens* as many as petals and alternate with them, rarely numerous, inserted outside the disk; anthers didymous; dehiscence longitudinal, lateral. *Ovary* inferior, 2-locular, or loculi as many as stamens, rarely 1-locular; styles as many as cells, connate or free; ovules in each loculus solitary, pendulous, anatropous. *Fruit* usually small, berry-like or drupaceous, one or more cells sometimes suppressed. *Seed* pendulous; testa very thin; albumen fleshy or cartilaginous, sometimes ruminate; embryo minute, near hilum.

Petals slightly overlapping in bud; pedicels jointed; styles distinct; leaves compound; ovary (in our species) 4- or more-chambered; albumen of seed uniform..**Aralia.**
Petals valvate in bud:—
  *Ovary 2-chambered:—[p. 542]
    Albumen of seed ruminate; pedicels continuous:—
      Styles distinct; leaves more than once pinnately compound **Heteropanax.**
      Styles combined; leaves simple and palmately lobed, or if compound digitate ....**Brassaiopsis.**
    Albumen of seed uniform; pedicels jointed; leaves more than once pinnately compound; styles distinct ....**Panax.**

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*Ovary 4- or more-chambered; albumen of seed uniform; pedicels continuous; leaves not pinnate; styles united, at least at the base :— [p. 541]

Leaves (in our species) perfectly digitately compound; fruit angular, not larger than a pea ....**Heptapleurum.**

Leaves simple, deeply palmately lobed, or imperfectly digitately compound; fruit ovoid, ·5 in. long ....**Trevesia.**

394. **Aralia** Linn.

Herbs, shrubs, or small trees, glabrous, hairy, or prickly; *leaves* alternate or whorled, digitate, pinnate, or compound pinnate; leaflets serrate or nearly entire; stipules small. *Flowers* often polygamo-monœcious, in solitary, less often racemed or panicled umbels, rarely in compound umbels; pedicels jointed or not close to the flower. *Sepals* 5, connate in a truncate or 5-toothed calyx. *Petals* 5; ovate, imbricate. *Stamens* 5. *Carpels* 2–5, connate in a 2–5-celled ovary; styles 2–5, free or, in fertile flowers, often connate at base. *Fruit* a small, 4–5-celled and 4–5-angled, or 2–3-celled and subglobose berry. *Seeds* compressed; albumen uniform.

918. ARALIA FOLIOLOSA Seem.; F. B. I. ii. 723.

Chittagong.

A large lax shrub, armed with numerous prickles.

395. **Heteropanax** Seem.

A small unarmed tree; *leaves* very large, pinnately decompound, almost or quite glabrous; stipules not prominent. *Flowers* polygamous, umbels racemed, more or less stellately hairy, usually only the terminal umbel of each branch of the raceme fruiting; bracts small, ovate, obtuse, persistent; pedicels not jointed. *Sepals* connate in a calyx with subentire limb. *Petals* 5, valvate. *Stamens* 5. *Carpels* 2, connate in a 2-celled ovary; styles 2, distinct throughout, spreading. *Fruit* a laterally compressed, 2-seeded berry. *Seed* compressed; albumen ruminate.

919. HETEROPANAX FRAGRANS Seem.; F. B. I. ii. 734. *Panax fragrans* F. I. ii. 76.

Chota Nagpur; E. Bengal; Chittagong.

A small unarmed tree. *Vernac.* Guti-suna.

396. **Brassaiopsis** Dcne & Planch.

Large shrubs or trees, armed or not; *leaves* digitate or palmate or angled; stipules intrapetiolar, connate, not prominent. *Flowers*

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often polygamous; umbels in large compound panicles, young parts stellately tomentose; bracts small, often persistent; pedicels each with a dense cluster of persistent bracteoles, not jointed. *Sepals* connate in a 5-toothed calyx. *Petals* 5, valvate. *Stamens* 5. *Carpels* 2, connate in a 2-celled ovary; styles long or short, united; stigmas apical, oblique, introrse. *Fruit* a globose or turbinate drupe; pyrenes 2, or by abortion 1. *Seed* not compressed; albumen ruminate.

Leaves simple, palmate, divided about half-way down into oblong, acute segments ....*palmata.*
Leaves compound, digitate; petioles long; leaflets lanceolate or elliptic *speciosa.*

920. Brassaiopsis palmata Kurz; F. B. I. ii. 735. *Panax palmatum* F. I. ii. 74.
Chittagong.
A small tree, prickly towards tips of branches.

921. Brassaiopsis speciosa Dcne & Planch.; F. B. I. ii. 737; E. D. B. 798.
Chittagong.
A small tree, ends of branches, and sometimes also the panicle, prickly.

397. **Panax** Linn.

Shrubs or trees; *leaves* pinnate or digitate; leaflets entire or serrate. *Flowers* often polygamous; umbels paniculate; pedicels jointed. *Sepals* 5, connate in an entire or toothed calyx. *Petals* 5, valvate. *Stamens* 5. *Carpels* 2, rarely 3, connate in a 2–3-celled ovary; styles distinct. *Fruit* a subcompressed or globose, 2-, rarely 3-seeded berry, the carpels rounded on the back. *Seed* laterally compressed or subterete, smooth or sulcate; albumen uniform.

922. Panax fruticosum Linn.; F. I. ii. 76; F. B. I. ii. 725.
Cultivated.
A shrub, 3–6 feet high.

398. **Heptapleurum** Gaertn.

Large shrubs, sometimes climbing, or trees, unarmed; *leaves* digitate, rarely compound digitate, or 1-foliolate; leaflets coriaceous, entire or distantly toothed or lobed, those of the upper leaves almost always entire; stipules prominent, often intra-

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petiolar, connate. *Flowers* in umbels, rarely heads, arranged in compound racemes; bracts woolly, deciduous or persistent; bracteoles usually few or 0, rarely densely tufted; pedicels not jointed. *Sepals* connate in a toothed or truncate calyx-tube. *Petals* 5, or 6 or more, valvate. *Stamens* (in our species) 5, or 6 or more (as many as the petals). *Carpels* 5 (in our species) or 6 or more (as many as the petals), connate in a 5–many-celled ovary, with a small or conspicuous disk; styles small, distinct (in our species), or sometimes connate in a narrow cylindric column. *Fruit* a subglobose, 5–6-angled, dry drupe. *Seeds* compressed; albumen uniform.

923. HEPTAPLEURUM VENULOSUM Seem.; F. B. I. ii. 729; E. D. H. 131. *Aralia digitata* F. I. ii. 107.
Behar; Chota Nagpur.
A climbing shrub. *Hind.* Dain; *Kol.* Sukriruin.

399. Trevesia Vis.

Shrubs or small trees, unarmed or prickly; *leaves* palmate or digitate; petiolules often united by a basal wing; stipules connate, intrapetiolar or obsolete. *Flowers* polygamous, rather large; umbels panicled; bracts small or 0; pedicels not jointed. *Sepals* connate in a truncate or toothed calyx-tube. *Petals* 8–12, valvate, subcoriaceous, in the fertile flowers often calyptrate. *Stamens* 8–12, usually 10. *Carpels* 8–12, connate in an ovary with as many cells as there are petals or stamens; styles connate in a short umbo or column. *Fruit* a large, ovoid berry. *Seed* compressed; albumen uniform.

924. TREVESIA PALMATA Vis.; F. B. I. ii. 732. *Gastonia palmata* F. I. ii. 407.
Chittagong.
A small tree, 10–15 feet high.

Order LXVIII. CORNACEÆ.

Shrubs or trees. *Leaves* opposite or alternate, generally petioled, entire or sometimes angled, lobed or serrate; stipules 0. *Flowers* regular, usually small, hermaphrodite or 1-sexual, in axillary or terminal cymes, panicles, or heads. *Disk* usually fleshy, sometimes inconspicuous, epigynous. *Sepals* connate in a tube, adnate to ovary; limb truncate or 4–5-toothed, persistent.

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Petals 0 or 4–5, occasionally many, epigynous, imbricate or valvate. *Stamens* inserted with and as many as, rarely 2–4 times as many as the petals; anthers short or long; dehiscence longitudinal, introrse or lateral. *Ovary* inferior, 1–4-locular, crowned by the disk; style simple, short or long; stigma capitate or branched; ovules in each locule solitary, very rarely 2–3, pendulous from apex, anatropous. *Fruit* usually drupaceous, with a solitary, 1–4-celled pyrene, less often with 2 pyrenes. *Seed* oblong, pendulous; albumen fleshy; embryo axial, sometimes minute, sometimes with leafy cotyledons.

Stamens twice or thrice as many as petals; cotyledons corrugate **Alangium.**
Stamens as many as petals; cotyledons flat .... **Marlea.**

400. Alangium Lamk.

Shrubs, sometimes climbing, or small trees, armed or not; *leaves* alternate, petioled, oblong, entire, 3-nerved at base. *Flowers* in axillary fascicles or condensed cymes, hermaphrodite, white; pedicels jointed under calyx; bracts 0. *Sepals* 6–10, connate in a calyx-tube, adnate to ovary; limb toothed or truncate. *Petals* 6–10, linear, oblong, valvate in bud, reflexed in flower. *Stamens* twice as many as petals or more (in our species usually 20–30); filaments hairy; anthers much elongated. *Carpel* solitary, inferior, crowned by a disk; style very long; stigma large, capitate; ovule solitary, pendulous. *Fruit* a 1-seeded berry, crowned by the somewhat accrescent calyx-limb. *Seed* oblong; albumen ruminate; embryo with leafy, corrugate cotyledons.

925. ALANGIUM LAMARCKII Thw.; F. B. I. ii. 741; E. D. A. 681.
A. hexapetalum F. I. ii. 502.
Behar; Chota Nagpur; W. Bengal.
A small tree, reaching 20–25 feet high, often only a shrub. *Hind.* Akola; *Beng.* Ankura; *Uriya* Ankula; *Santal.* Dela.

401. Marlea Roxb.

Trees or shrubs; *leaves* alternate, petioled, orbicular or oblong from an oblique base. *Flowers* hermaphrodite, in contracted axillary cymes; pedicels jointed. *Sepals* connate in a toothed or truncate calyx-tube. *Petals* 4–8, linear, free or somewhat connate at the base, valvate. *Stamens* 4–8 (in our species almost always

8), slightly adnate at base to the petals and there hirsute; anthers linear. *Carpels* 1–3, if more than one, connate in a completely 2–3-celled ovary, or 1-celled at apex and 2–3-celled below; ovules in each complete or incomplete cell solitary; style long, often thickened upwards; stigma simple or with 4 linear or subclavate lobes. *Fruit* a 1–2-celled, 1–2-seeded berry. *Seed* oblong, compressed; cotyledons orbicular, thin, leafy.

926. MARLEA BEGONIÆFOLIA Roxb.; F. I. ii. 261; F. B. I. ii. 743; E. D. M. 289.

N. Bengal; Chittagong.

A tree 20–60 feet high. *Vernac.* Marleza, marlia.

III.—COROLLIFLORÆ.

Sepals often connate in a usually persistent calyx, more or less adnate to the ovary or free; free sepals or calyx-lobes as many as petals, or, by union of adjacent lobes, fewer than petals. *Petals* almost always connate in a corolla, the elements of which are 1-seriate, usually 4–5, rarely fewer or 6 or more, very rarely (*Sapotaceæ*) 2-seriate. *Stamens* 1-seriate, as many as petals or fewer, sometimes 2-seriate and twice as many as petals, very rarely (*Styraceæ* and *Ebenaceæ*) indefinite; filaments usually more or less adnate to corolla-tube, rarely free within the corolla, very rarely adnate to pistil. *Carpels* as many as petals, or often fewer, sometimes solitary, always more or less connate, if the carpels themselves be free the styles are united at base or apex, if the styles be free the carpels are connate; ovary in a 2- or more-carpellary pistil usually with as many cells as the constituent carpels, less often with twice as many cells by development of accessory dissepiments, in either case with 1- or more-ovuled placentas on the inner angle or occasionally on the dissepiments some distance from the inner angle, sometimes with only one cell and then with as many 1- or more-ovuled parietal placentas as the constituent carpels or with a basal central placenta; ovary in a mono-carpellary pistil usually oblique, with the generally 1-ovuled placenta excentric.

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Order LXIX. CAPRIFOLIACEÆ.

Shrubs, erect or scandent, or small trees, very rarely herbs; branches round. *Leaves* opposite, rarely alternate, simple, lobed, or odd-pinnate, sometimes 3-nately cut; stipules 0, or if present interpetiolar. *Flowers* hermaphrodite, cymose or paniculate, rarely capitate; regular or irregular. *Sepals* connate in a calyx-tube, adnate to ovary; limb 3–5-toothed or -lobed. *Petals* connate in a 5-lobed, often 2-lipped corolla; lobes imbricate in bud. *Stamens* 5, adnate to corolla-tube and alternate with the corolla-lobes; anthers versatile; dehiscence introrse. *Carpels* connate in an inferior, 2–8-celled, rarely 1-celled ovary; ovules solitary pendulous, or several on axial placentas; style long, with stigma capitate, or short, with stigma 2–5-lobed. *Fruit* a drupe with 1–8 cartilaginous pyrenes, or a many-seeded berry. *Seeds* 1 or many in each cell; albumen copious, fleshy; embryo usually minute.

402. Sambucus Linn.

Shrubs or small trees; *leaves* odd-pinnate, large; leaflets serrate or laciniate; stipules absent or present. *Flowers* small, in large, much-branched corymbs; bracts always present; pedicels jointed; bracteoles small or 0. *Sepals* connate in a 3–5-toothed calyx. *Petals* connate in a rotate or campanulate 3–5-partite corolla. *Stamens* 5, adnate to nearly the base of the corolla-tube. *Carpels* connate in a 3–5-celled ovary; ovules in each cell solitary, pendulous; style short, 3–5-partite, or stigmas 3–5, sessile. *Fruit* a small, 3–5-celled berry, crowned by the calyx-teeth. *Seeds* compressed; embryo elongated.

927. SAMBUCUS JAVANICA Bl.; F. B. I. iii. 2; E. D. s. 767.
N. Bengal, Duars; E. Bengal.
A straggling shrub.

Order LXX. RUBIACEÆ.

Trees, shrubs, or herbs, rarely annual, erect or twining, unarmed or provided with spines or hooks, rarely prickly. *Leaves* simple, opposite or whorled, quite entire, with interpetiolar or less often intrapetiolar stipules, or very rarely with stipules replaced by leaves. *Flowers* often 2–3-morphic; inflorescence very variable. *Sepals* connate in a calyx-tube, adnate to ovary; limb various.

Petals connate in a regular gamopetalous corolla; lobes 4–5, valvate, imbricate, or contorted. *Stamens* 4–5, inserted on the mouth or in the tube of the corolla, alternate with its lobes, filaments short or obsolete, or long; anthers 2-celled, usually dorsifixed; dehiscence lateral or introrse. *Disk* epigynous, usually annular or cushion-like. *Carpels* connate in an inferior 2–10-celled ovary; ovules 1 or more in each cell; style simple or cleft; stigmas various. *Fruit* 2–10-celled, a berry, drupe, or capsule, or composed of mutually separating indehiscent cocci. *Seeds* various; albumen fleshy or horny; embryo straight or curved; cotyledons flat or semi-terete; radicle superior or inferior.

*Ovules numerous, or, if few, at least more than one in each cell:—[p. 549]

†Fruit dry, dehiscent, or if indehiscent separating into 2–4, several-seeded cocci, rarely nutlike:—[p. 549]

Flowers in dense globular heads; corolla funnel-shaped; stigma simple, far exserted:—

Ovaries confluent; fruits forming a globose, solid mass; corolla-lobes imbricate in bud; heads not bracted; trees...**Anthocephalus.**

Ovaries free or nearly so; fruits quite separate, capsular; corolla-lobes valvate in bud:—

Flowers intermixed with paleaceous bracteoles; trees:—

Calyx-limb 5-toothed; heads with or without bracts ...**Adina.**

Calyx-limb entire; heads with 2 wide bracts......**Stephegyne.**

Flowers not mixed with bracteoles; climbers with hooked peduncles ....**Uncaria.**

Flowers axillary, solitary or fascicled, or in axillary or terminal cymes, racemes or panicles; never in dense globose heads:—

Corolla-lobes twisted in bud; fruit capsular, 2-celled; seeds angular but not winged; flowers in panicles; trees or shrubs **Wendlandia.**

Corolla-lobes valvate in bud:—

Trees; flowers with leafy bracts, in panicled spikes; fruits capsular, 2-celled; seeds winged ....**Hymenodictyon.**

Herbs; flowers solitary or fascicled, axillary, or in axillary or terminal cymes:—

‡Fruit oblong, subglobose or orbicular:—[p. 549]

Fruit indehiscent, globose, nut-like, 2-celled; lobes of corolla 5, each 2–3-toothed; stipules entire; flowers solitary, axillary...**Dentella.**

Fruit dehiscent, usually slightly oblong, 2-celled, or if indehiscent (often in *Hedyotis*) the corolla-lobes 4, quite

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entire; stipules bristly, not entire; flowers in cymes, not solitary :—

Calyx-teeth contiguous; capsule (in our species) tardily dehiscent or indehiscent; seeds usually angular; cymes dense ....**Hedyotis.**

Calyx-teeth remote; capsule loculicidally dehiscent above calyx, very rarely indehiscent :—

Seeds minute, angular; cymes laxly paniculate **Oldenlandia.**

Seeds plano-convex or globose with a ventral cavity **Anotis.**

‡Fruit broadly, didymously obcordate, with 2 compressed, spreading lobes opening above calyx by gaping slits; flowers secund in dichotomous cymes [p. 548] ....**Ophiorrhiza.**

†Fruit fleshy or leathery, a berry; or drupe-like with 2 or more many-seeded pyrenes; shrubs or trees; seeds not winged :—[p. 548]

Corolla valvate; seeds many, small, angled :—

Inflorescence lax; fruit a berry :—

Inflorescence terminal; calyx with one lobe usually forming a coloured leaf ....**Mussænda.**

Inflorescence axillary; calyx equally 4–5-lobed ...**Adenosacme.**

Inflorescence subcapitate; calyx with 5 rigid lobes; fruit a drupe with 2 many-seeded pyrenes ....**Myrioneuron.**

Corolla imbricate or contorted :—

Stamens inserted at base of corolla-tube; lobes of corolla imbricate; seeds small; cotyledons minute; inflorescence terminal **Hamelia.**

Stamens inserted at or near mouth of corolla-tube; lobes of corolla contorted; seeds large; cotyledons often leafy; inflorescence axillary :—

Ovary 1-celled; seeds many; stigma fusiform ....**Gardenia.**

Ovary 2-celled :—

Seeds many; stigma fusiform ....**Randia.**

Seeds few; style-arms two :—

Flowers in axillary spikes ....**Petunga.**

Flowers in axillary fascicles :—

Flowers sessile; anthers hirsute, subincluded **Hyptianthera.**

Flowers usually pedicelled; anthers exserted, glabrous **Diplospora.**

*Ovules solitary in each cell :—[p. 548]

§Corolla-lobes contorted in bud; stipules interpetiolar, solitary; shrubs or small trees :—[p. 550]

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- Flowers in large corymbs; stigma fusiform, exserted:—
  - Corolla-lobes 5; style short, pubescent; stigma stout **Webera § Pseudixora.**
  - Corolla-lobes 4 (rarely 5 in *Pavetta*); style long, slender, glabrous; stigma slender:—
    - Bracts membranous, the lower sheathing.................**Pavetta.**
    - Bracts coriaceous, not sheathing..............................**Ixora.**
- Flowers axillary, solitary or fascicled; style-arms 2, linear...**Coffea.**

§Corolla-lobes valvate in bud:—[p. 549]

- Shrubs or small trees, usually erect; leaves stipulate:—
  - Flowers in dense heads, calyces confluent; fruits forming a globose or oblong solid mass; erect shrubs or small trees **Morinda.**
  - Flowers free:—
    - Erect shrubs or small trees:—
      - Fruit drupaceous; styles not papillose:—
        - Style stout, stigma large; ovules pendulous; radicle superior; flowers axillary, fascicled:—
          - Ovary 2-celled..**Canthium.**
          - Ovary 3–5-celled ....**Vangueria.**
        - Style slender, stigma divided; ovules erect; radicle inferior:—
          - Flowers in terminal cymes; calyx-limb shortly 4–5-toothed; style-arms 2...............................**Psychotria.**
          - Flowers in axillary fascicles; calyx-limb deeply 3–6-fid; style-arms 3–9 ....**Lasianthus.**
      - Fruit capsular; capsule 5-valved at apex; style 5-fid, papillose; flowers densely panicled.................................**Hamiltonia.**
    - Twining fœtid shrubs; styles 2, capillary, twisted, papillose; fruit of 2 dorsally compressed, 1-seeded pyrenes; flowers panicled ....**Pæderia.**
- Herbs:—
  - ¶Leaves opposite, stipulate; stipules setaceous, connate with the petioles into a toothed cup; fruit of 2 separable cocci:—[p. 551]
    - Ovules pendulous; seeds compressed dorsally, radicle superior; fruit very small, the separable cocci indehiscent ....**Knoxia.**
    - Ovules attached to septum of ovary; seeds oblong; radicle inferior:—
      - Fruit large, corky, oblong-obovoid, acutely 3–4-keeled between the sharp margins; the separable cocci indehiscent **Hydrophylax.**
      - Fruit small, crustaceous; one or both of the separable cocci dehiscent ....**Spermacoce.**

¶Leaves whorled; stipules replaced by leaves; fruit of two coriaceous or fleshy, indehiscent lobes [p. 550] ....**Rubia.**

403. Anthocephalus A. Rich.

A glabrous tree; *leaves* petioled; stipules lanceolate, caducous. *Flowers* united by their confluent calyx-tubes in terminal, globose, solitary, peduncled heads; bracts stipule-like at base of peduncles; bracteoles 0. *Sepals* connate in a tubular calyx; limb 5-lobed, persistent or deciduous. *Petals* 5, connate in a long, funnel-shaped corolla; throat glabrous; lobes of limb imbricate. *Stamens* 5, adnate to throat of corolla; filaments short; anthers ovate-oblong, apiculate. *Disk* small or 0. *Carpels* connate in an inferior ovary, 2-celled at base, 4-celled above; ovules numerous, horizontal on 2 ascending 2-fid placentas, a lobe projecting into each of the 4 upper partial loculi; style simple, exserted; stigma fusiform. *Fruit* a confluent, fleshy mass of many few-seeded, coriaceous pyrenes. *Seeds* minute; testa thinnish; albumen fleshy; embryo clavate.

928. ANTHOCEPHALUS CADAMBA Miq.; F. B. I. iii. 23; E. D. A. 1192. *Nauclea Cadamba* F. I. i. 512.

Very generally planted.

A large tree. *Vernac.* Kadam.

404. Adina Salisb.

Trees or shrubs; *leaves* petioled; stipules large, caducous. *Flowers* densely crowded in solitary or panicled globose heads, on a hairy receptacle; peduncles with or without bracts; bracteoles 0. *Sepals* connate in a 5-angled tubular calyx; limb 5-lobed. *Petals* 5, connate in a long, funnel-shaped tube; lobes valvate. *Stamens* 5, adnate to mouth of corolla; filaments short; anthers short, oblong. *Carpels* connate in a 2-celled ovary; ovules many, imbricately set on a pendulous placenta in each cell; style simple, filiform; stigma capitate or clavate. *Fruit* a cluster of capsules, each separating into 2 follicular cocci and many-seeded. *Seeds* oblong; testa winged; albumen fleshy; cotyledons flat; radicle cylindric, superior.

*Flowers downy or silky:—[p. 552]

†Leaves petioled, orbicular, cordate, acuminate, pubescent beneath; peduncles axillary, 1-3, 1-headed [p. 552] ....*cordifolia.*

†Leaves sessile, oblong, subcordate, tips rounded, quite glabrous; peduncles terminal, 1–3, 1-headed [p. 551]......................*sessilifolia.*

*Flowers glabrous; leaves shortly petioled, lanceolate, caudate-acuminate, glabrous; heads in trichotomous panicles [p. 551] ....*polycephala.*

929. ADINA CORDIFOLIA Hook. f.; F. B. I. iii. 24; E. D. A. 514. *Nauclea cordifolia* F. I. i. 514.

Chota Nagpur; Behar; W. and N. Bengal.

A considerable tree; wood hard. *Hind.* Haldu, hardu; *Beng.* Bangka, da-kóm, petpuria, kali-kadam; *Uriya* Holonda; *Santal.* Karám; *Kol.* Kurumbá, komba sanko.

930. ADINA SESSILIFOLIA Hook. f.; F. B. I. iii. 24; E. D. A. 519. *Nauclea sessilifolia* F. I. i. 515.

Chittagong.

A small tree. *Beng.* Kúm.

931. ADINA POLYCEPHALA Benth.; F. B. I. iii. 25; E. D. A. 518.

Chittagong.

A small evergreen tree.

405. **Stephegyne** Korth.

Shrubs or trees; *leaves* petioled; stipules large, caducous. *Flowers* united by their confluent calyx-tubes in globose, axillary and terminal, solitary or panicled or subumbelled heads, each peduncled, with two deformed apical leaves, within which are 2 caducous bracts; bracteoles paleaceous. *Sepals* 5, connate in a short calyx-tube, with a cup-shaped or tubular limb, entire or 5-toothed. *Petals* 5, connate in a corolla with long, funnel-shaped tube; throat glabrous or hairy; lobes short, valvate. *Stamens* 5, adnate to corolla-throat; filaments short; anthers cordate, lanceolate, apiculate. *Carpels* connate in a 2-celled ovary; ovules imbricately set on pendulous placentas; style filiform; stigma capitate or mitriform. *Fruit* of 2 follicular, many-seeded cocci. *Seeds* small; testa winged; albumen fleshy.

Calyx-limb short but distinct; tube of corolla much exceeding the glabrous lobes ....*parvifolia.*

Calyx-limb 0; tube of corolla not exceeding the bearded lobes *diversifolia.*

932. STEPHEGYNE PARVIFOLIA Korth.; F. B. I. iii. 25; E. D. S. 2799. *Nauclea parvifolia* F. I. i. 513.

Chota Nagpur; Behar; E. Bengal, Mymensingh.

A small or medium tree. *Hind.* Kadam, keim, kangi; *Kol.* Gui, komba; *Santal.* Goré.

933. STEPHEGYNE DIVERSIFOLIA Hook. f.; F. B. I. iii. 26; E. D. S. 2796. *Nauclea rotundifolia* F. I. i. 516.

Chittagong.

A small tree.

406. **Uncaria** Schreb.

Climbing shrubs, often with hooks; *leaves* short-petioled; stipules entire or 2-fid. *Flowers* in axillary peduncled, solitary or panicled globose heads, the lower peduncles often headless and hooked. *Sepals* connate in a fusiform calyx-tube; limb 5-lobed or -partite. *Petals* 5, connate in a long, funnel-shaped tube; throat glabrous; lobes valvate. *Stamens* 5, adnate to throat of corolla; filaments short; anthers with 2 basal bristles. *Carpels* connate in a 2-celled ovary; ovules many, ascending, on projecting placentas; style filiform; stigma capitate. *Fruit* an elongated, septicidally 2-valved, many-seeded capsule. *Seeds* with testa winged above and below; albumen fleshy; embryo clavate.

Slender 4-angled branches and leaves glabrous; calyx-lobes small, rounded; corolla-tube glabrous; lobes glabrous or silky; capsules turgid, pubescent, sessile .... *sessilifructus.*

Stout rounded branches and leaves beneath and on nerves above tomentose; calyx-lobes linear, as long as tube; corolla-tube and lobes hairy or pubescent; capsules almost glabrous:—

- Peduncles all axillary, bracteate near middle; leaves beneath grey-tomentose with short hairs; capsules clavate, sessile .... *pilosa.*
- Peduncles terminal as well as axillary, bracteate near top; leaves beneath rusty-tomentose; capsules spindle-shaped, with long, slender pedicels .... *macrophylla.*

934. UNCARIA SESSILIFRUCTUS Roxb.; F. I. i. 520; F. B. I. iii. 30.

Chittagong.

A large climber.

935. UNCARIA PILOSA Roxb.; F. I. i. 520; F. B. I. iii. 32.

Chittagong.

A stout climber.

936. UNCARIA MACROPHYLLA Wall.; F. B. I. iii. 32.

N. Bengal, Duars.

A very large, strong climber.

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407. **Wendlandia** Bartl.

Shrubs or small trees; *leaves* opposite or ternate; stipules entire or 2-fid. *Flowers* small, white or pinkish, in dense terminal thyrsoid or paniculate cymes; bracteoles 2–3. *Sepals* connate in a subglobose tube; limb 4–5-lobed; lobes small, subequal, persistent. *Petals* 4 or 5, connate in a small, tubular, hypocrateriform or funnel-shaped corolla; throat glabrous or hairy; lobes imbricate. *Stamens* 4 or 5, adnate to limb of corolla between the lobes; filaments 0 or elongated; anthers versatile, exserted, linear or oblong. *Carpels* connate in a 2-celled, rarely 3-celled ovary; ovules many on small globose placentas; style filiform; stigma entire, 2-fid or 2-partite. *Fruit* a small, globose, loculicidally, rarely septicidally, 2-valved, many-seeded capsule. *Seeds* very small, horizontal, compressed; testa membranous, obscurely winged; albumen fleshy; embryo short, cylindric.

Corolla-tube shorter than the lobes; anthers much exserted, nearly as large as corolla-lobes ....*exserta.*

Corolla-tube slender, much longer than the lobes; anthers small, shortly exserted ....*tinctoria.*

937. WENDLANDIA EXSERTA DC.; F. B. I. iii. 37; E. D. W. 33. *Rondeletia exserta* F. I. i. 523.

Tirhut; Behar; Chota Nagpur; Orissa; W. Bengal.

A small crooked tree. *Hind.* Chanlai, chil-kiya, tilai, tilki, birsa; *Santal.* Hundro, pichari baha.

938. WENDLANDIA TINCTORIA DC.; F. B. I. iii. 38; E. D. W. 38. *Rondeletia tinctoria* F. I. i. 522.

Chota Nagpur; E. Bengal, Mymensingh; Chittagong.

A small shapely tree. *Beng.* Tula-lodh; *Santal.* and *Kol.* Tilai.

408. **Hymenodictyon** Wall.

Trees or shrubs, with thickened branches and bitter bark; *leaves* petioled, deciduous; stipules deciduous. *Flowers* small, spicate; the spikes in axillary and terminal drooping panicles, with 1 or 2 large, leafy, reticulate, persistent bracts; bracteoles small or 0. *Sepals* connate in a short, ovoid calyx; lobes 5 or 6, ovate or subulate, deciduous. *Petals* 5, connate in a funnel-shaped or campanulate corolla, glabrous within; lobes short, valvate, with exserted edges. *Stamens* 5, adnate below the corolla-throat; filaments short, dilated upwards; anthers linear. *Carpels* connate in a 2-celled ovary; ovules many on cylindric, adnate placentas; style filiform; stigma fusiform. *Fruit* a loculicidally 2-valved, many-seeded capsule, the slender placentas at length free. *Seeds* imbricating upwards; testa wide-winged; albumen fleshy; embryo minute.

939. HYMENODICTYON EXCELSUM Wall.; F. B. I. iii. 35; E. D. H. 517. *Cinchona excelsa* F. I. i. 529.

Tirhut; Chota Nagpur; E. Bengal.

A deciduous tree, 30–40 feet high. *Hind.* Bhanlan, bhámin, dhauli, kukurkat; *Uriya* Bodoka, konu; *Kol.* Sali; *Santal.* Bhorkund.

409. Dentella Forst.

A small, weak, prostrate, annual or perennial-rooted herb; stems branching subdichotomously and nodes rooting; *leaves* small; stipules connate, scarious. *Flowers* minute, solitary, axillary and in the forks, sessile or pedicelled, white. *Sepals* connate in a globose calyx; limb tubular, 5-fid, persistent. *Petals* 5, connate in a funnel-shaped tube, hairy within; lobes 5, dentate, induplicate-valvate. *Stamens* 5, adnate to middle of corolla-tube; filaments short; anthers linear. *Carpels* connate in a 2-celled ovary; ovules many on hemispheric placentas; style short; stigmas filiform. *Fruit* small, dry, globose, 2-celled, indehiscent, many-seeded. *Seeds* minute, angled; testa dotted; albumen fleshy; embryo ovoid.

940. DENTELLA REPENS Forst.; F. I. i. 532; F. B. I. iii. 42.

In all the provinces.

A small straggling weed.

410. Hedyotis Linn.

Herbs, undershrubs or shrubs; *leaves* opposite, rarely ternate; stipules free or connate in a bristly sheath. *Flowers* white or lilac, in terminal or axillary, open, compact, or capitate cymes. *Sepals* connate in an ovoid or turbinate calyx; lobes 4, acute, persistent. *Petals* 4, connate in a funnel-shaped or campanulate corolla; lobes ovate or linear, imbricate. *Stamens* 4, adnate to tube or throat of corolla; filaments short or long; anthers included or exserted, shape various. *Carpels* connate in a 2-celled ovary; ovules numerous, on sessile or stalked placentas on or below the middle of the septum; style filiform; stigma 2-fid or 2-lobed. *Fruit* a small, membranous, coriaceous or crustaceous, septicidal or loculicidal capsule, sometimes of 2 separable or connate cocci, or quite indehiscent; cells or cocci 2–many-seeded. *Seeds* plano-convex or angled; testa hardly ever winged; albumen horny; embryo clavate.

Capsule dividing septicidally into 2 cocci, each several-seeded and ventrally dehiscent; top of capsule rounded and protruded between the calyx-teeth; cymes subumbellate; a much-branched, stoutish, climbing herb .... *scandens*.

Capsule tardily loculicidally dehiscent on the crown only, or quite indehiscent:—

Fruit loculicidally opening on the crown; cells many-seeded; leaves with 1 central nerve; capsules hispid:—

Leaves narrow-linear, scabrid above; flowers in sessile, capitate, axillary and terminal cymes; calyx-teeth subulate, shorter than the capsule .... *pinifolia*.

Leaves elliptic to lanceolate, scabrid on both surfaces; flowers 2–6 in axillary clusters; calyx-teeth triangular, about as long as the capsule .... *hispida*.

Fruit altogether indehiscent:—

Fruit hard, minute; cells few-seeded; cymes all axillary; leaves longitudinally plaited, rarely flat, always more than 1-nerved:—

Cymes sessile; flowers subsessile; calyx-teeth shorter than the glabrous or hispid fruit .... *Auricularia*.

Cymes peduncled; flowers pedicelled:—

Peduncles short; calyx-teeth longer than the hispid fruit *lineata*.

Peduncles long, filiform; calyx-teeth shorter than the glabrous fruit .... *glabra*.

Fruit membranous, broadly obconic; cells many-seeded; cymes axillary and terminal; leaves 1-nerved; calyx-teeth lanceolate, recurved, longer than the teeth .... *Thomsoni*.

941. **Hedyotis scandens** Roxb.; F. I. i. 364; F. B. I. iii. 57.

Chittagong.

A considerable climber. *Vernac.* Guji.

942. **Hedyotis pinifolia** Wall.; F. B. I. iii. 60.

Behar; Chota Nagpur.

A slender, wiry, annual herb, with 4-angled stems.

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943. Hedyotis hispida Retz; F. I. i. 364 ; F. B. I. iii. 60.

Behar; Chota Nagpur; Chittagong.

An annual herb; stem terete below, 4-angled above.

944. Hedyotis Auricularia Linn.; F. I. i. 365; F. B. I. iii. 58; E. D. H. 66.

N. Bengal, Duars; Chittagong.

A herb, 1·5–2 feet high; stem and branches terete.

945. Hedyotis lineata Roxb.; F. I. i. 365; F. B. I. iii. 59.

E. Bengal; Chittagong.

A herb, 1·5–2 feet high.

946. Hedyotis glabra Br.; F. B. I. iii. 59. *Spermacoce glabra* F. I. i. 368.

Chittagong.

A herb, 2–3 feet high; stem round, smooth, fistular.

947. Hedyotis Thomsoni Hook. f.; F. B. I. iii. 63.

N. and E. Bengal.

A small annual herb, on muddy river-banks.

411. **Oldenlandia** Linn.

Erect, slender, or diffuse, 2–3-chotomously branched herbs; *leaves* usually small and narrow; stipules acute or bristly. *Flowers* small, usually in dichotomous, axillary and terminal, generally paniculate cymes, rarely solitary. *Sepals* connate in a turbinate or subglobose calyx; lobes 4, rarely 5, usually erect and often distant in fruit, occasionally leafy and close together, sometimes with intercalated accessory teeth. *Petals* 4, rarely 5, connate in a rotate, hypocrateriform or funnel-shaped corolla; lobes obtuse, valvate. *Stamens* 4, rarely 5, adnate to mouth of corolla; filaments short; anthers usually exserted. *Carpels* connate in a 2-celled ovary; ovules usually many, on placentas near base of septum; style filiform; stigmas 2, linear. *Fruit* a small capsule, usually membranous, terete or didymous or angled, opening loculicidally at the apex, rarely quite indehiscent, many-seeded. *Seeds* angled or globose; testa not winged, smooth or pitted; albumen fleshy; embryo clavate.

*Seeds distinctly angular; testa smooth:—[p. 558]

†Calyx-teeth triangular, lanceolate, their bases in fruit meeting; peduncles solitary, 1–2-flowered, filiform, as long as the flat, subacute, elliptic-lanceolate leaves; corolla-tube hardly exceeding calyx-teeth; a diffuse, flaccid herb; flowers mostly in lower axils [p. 558] *crystallina.*

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†Calyx-teeth subulate, their bases in fruit not contiguous:—[p. 557]

Flowers sessile, or on very short, thick pedicels, usually solitary; diffuse, flaccid herbs:—

Leaves flat, ovate, elliptic or orbicular, nerves distinct; flowers chiefly in upper axils, solitary or sometimes clustered; calyx-teeth as long as tube of rotate corolla................................*trinervia.*

Leaves with usually recurved margins, linear nerveless; flowers mostly in lower axils, always solitary; calyx-teeth hardly as long as tube of corolla ....*diffusa.*

Flowers pedicelled, or if nearly sessile then on axillary peduncles, if without peduncles in terminal sessile cymes:—

Flowers all axillary, or if terminal not panicled; margins of linear or narrow-lanceolate leaves usually recurved:—

Peduncles solitary from the lower, or sometimes also from the upper axils; flowers few or simple; pedicels long, filiform:—

Calyx-teeth not much shorter than corolla-tube; peduncles usually solitary, sometimes two, rarely 1-, usually 2–4-flowered; capsule not extended beyond tips of calyx-teeth; a diffuse or less often erect herb ....*corymbosa.*

Calyx-teeth considerably shorter than corolla-tube; peduncles always solitary, usually 1-, rarely 2-flowered; capsule extended beyond tips of calyx-teeth; a much-branched, always erect herb ....*Heynei.*

Peduncles from the upper axils chiefly, usually many-, never fewer than 3-flowered; pedicels very short; cymes subumbellate, rarely sessile, and if so then terminal; a diffusely branched, rigid herb ....*umbellata.*

Flowers only partly axillary, chiefly in large, open, terminal panicled cymes; erect herbs with linear leaves:—

Stem acutely 4-angled; calyx-teeth not much shorter than corolla-tube; capsules didymous; margins of leaves usually recurved..*brachiata.*

Stem terete; calyx-teeth very much shorter than corolla-tube; capsules globose; leaves usually flat:—

Stem copiously branched, branches filiform, spreading; flowers small, pale; corolla under ·2 in. long; capsules few- (about 12-) seeded ....*dichotoma.*

Stem sparingly branched, branches rigid, virgate; flowers large, dark brownish-pink; corolla over ·4 in. long; capsules many-seeded ....*gracilis.*

*Seeds hardly angled; testa deeply, coarsely pitted; leaves flat; calyx-teeth broadly triangular:—[p. 557]

Stem glabrous, leafy; branches leafy throughout; leaves opposite; capsules didymous ....*paniculata.*

Stem furfuraceous, naked below, or with 1 pair of leaves, and with 4 leaves in a whorl at commencement of branching; branches usually with each a whorl of 4 leaves or naked; capsules hemispheric *nudicaulis.*

948. OLDENLANDIA CRYSTALLINA Roxb.; F. I. i. 422; F. B. I. iii. 65.

C. and E. Bengal; Chittagong.

A diffuse, flaccid weed. *Beng.* Panki.

949. OLDENLANDIA TRINERVIA Retz; F. B. I. iii. 66.

Chittagong.

A diffuse flaccid weed.

950. OLDENLANDIA DIFFUSA Roxb.; F. I. i. 423; F. B. I. iii. 65.

In all the provinces.

A diffuse flaccid weed.

951. OLDENLANDIA CORYMBOSA Linn.; F. B. I. iii. 64; E. D. O. 132. *O. biflora* F. I. i. 423. *O. ramosa* F. I. i. 424.

In all the provinces.

A flaccid, usually diffuse, sometimes erect weed. *Hind.* Dhaman-papar; *Beng.* Khet-papra.

952. OLDENLANDIA HEYNEI Br.; F. B. I. iii. 65. *O. herbacea* F. I. i. 424.

Chota Nagpur; Orissa.

An erect branching weed.

953. OLDENLANDIA UMBELLATA Linn.; F I. i. 421; F. B. I. iii. 66; E. D. O. 137.

Orissa, on sand-dunes near the sea.

A prostrate, much-branched, rigid herb. *Hind.* Chirval; *Beng.* and *Uriya* Surbuli.

954. OLDENLANDIA BRACHIATA Wight; F. B. I. iii. 66.

Behar, Patna.

A slender, erect herb.

955. OLDENLANDIA DICHOTOMA Koen.; F. B. I. iii. 67.

Chota Nagpur.

A very slender, extensively branching herb of dry places.

956. OLDENLANDIA GRACILIS DC.; F. B. I. iii. 68. *O. senegalensis* F. B. I. iii. 68.

N. Bengal; Tirhut; Chota Nagpur.

A slender, erect herb of grassy places.

957. Oldenlandia paniculata Linn.; F. B. I. iii. 69. *O. alata* F. I. i. 421.
C. and E. Bengal.
A diffuse or erect succulent weed.

958. Oldenlandia nudicaulis Roth; F. B. I. iii. 70.
Behar; Chota Nagpur.
An erect, rather thickly softly stemmed herb.

412. **Anotis** DC.

Herbs, ascending or prostrate, rarely erect; stipules usually membranous or with marginal bristles. *Flowers* in axillary and terminal dense, rarely lax heads or cymes. *Sepals* connate in a compressed calyx-tube; lobes 4, with wide intervening sinuses. *Petals* 4, connate in a tubular or funnel-shaped corolla; lobes shorter than tube, valvate. *Stamens* 4, adnate to mouth of corolla; filaments short or long; anthers linear-oblong, included or exserted. *Carpels* connate in a 2-celled, rarely 3–4-celled ovary; ovules few or rarely solitary in each cell, on placentas ascending from near base of septum; style filiform; stigmas 2–4, linear. *Fruit* a didymous or laterally compressed capsule, the crown protruding between calyx-lobes and there loculicidally 2-valved, rarely indehiscent; cells 1- or few-seeded. *Seeds* peltate, boat-shaped, rarely plano-convex; testa coarsely pitted, rarely winged; albumen horny; embryo clavate.

959. Anotis calycina Hook. f.; F. B. I. iii. 73.
Chota Nagpur.
An erect, slender, annual herb.

413. **Ophorrhiza** Linn.

Small, erect, creeping or decumbent herbs, rarely undershrubs; *leaves* usually elliptic-lanceolate; stipules caducous. *Flowers* white, pink, or greenish, secund on the branches of axillary or terminal dichotomous cymes; bracts and bracteoles various or 0. *Sepals* connate in a short turbinate or subglobose calyx-tube; lobes 5, small, persistent. *Petals* 5, connate in a tubular or funnel-shaped corolla; lobes short, the back often winged, and often also with a fold in the sinus. *Stamens* 5, adnate to corolla-tube; filaments short or long; anthers linear, 2-fid at base. *Disk* large, 2-lobed. *Carpels* connate in a 2-celled ovary; ovules many, on basal ascending placentas; style filiform; stigmas linear or

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flattened. *Fruit* a compressed, obcordate, coriaceous capsule, girt in the middle by the calyx-limb; crown opening by 2 wide-gaping valves; placentas divaricate, many-seeded. *Seeds* minute, angled; testa crustaceous; albumen fleshy; embryo clavate.

Leaves membranous, thin:—
Cymes rather lax and flowers glabrous; capsules glabrous *Harrisiana* var. *argentea*.
Cymes dense-flowered, tomentose; capsules pubescent......*trichocarpa*.
Leaves firm, almost coriaceous; cymes very dense-flowered and clothed with dense, rusty pubescence ....*villosa*.

960. OPHIORRHIZA HARRISIANA Heyne var. ARGENTEA Hook. f.; F. B. I. iii. 78.
Chittagong.
A perennial herb, shrubby below.

961. OPHIORRHIZA TRICHOCARPA Bl.; F. B. I. iii. 78.
Chittagong.
A perennial herb.

962. OPHIORRHIZA VILLOSA Roxb.; F. I. i. 702; F. B. I. iii. 79.
Chittagong.
A perennial herb.

414. **Mussænda** Linn.

Shrubs or undershrubs, rarely herbs, erect or climbing; *leaves* opposite or ternate; stipules solitary or in pairs between the petioles. *Flowers* yellow, scarlet, or rarely white, in terminal cymes; bracts and bracteoles small, deciduous. *Sepals* connate in an oblong or turbinate calyx-tube; lobes of limb 5, usually deciduous, one of the 5 frequently developed as a large, peticled, bract-like white or coloured leaf. *Petals* 5, connate in a long corolla, tubular below, funnel-shaped above; tube usually silky, throat villous; lobes valvate, with edges everted. *Stamens* 5, adnate to throat or tube of corolla; filaments very short; anthers linear. *Carpels* connate in a 2-celled ovary; ovules many on peltate, fleshy placentas; style filiform; stigmas 2, linear. *Fruit* a fleshy, many-seeded berry with an areolate crown. *Seeds* minute; testa pitted; albumen fleshy; embryo minute.

Calyx-teeth persisting till the fruit is ripe ....*Roxburghii*.
Calyx-teeth deciduous as soon as flowering is over.....................*glabra*.

963. Mussænda Roxburghii Hook. f.; F. B. I. iii. 87.
N. Bengal, Duars; Tippera; Chittagong.
A suberect shrub.

964. Mussænda glabra Vahl; F. B. I. iii. 90.
N. Bengal, Duars; Chittagong.
A rambling or climbing shrub.

415. Adenosacme Wall.

Small shrubs, branches slender, fragile; *leaves* very membranous, many-nerved, sometimes toothed and glandular; stipules small or large. *Flowers* white, yellow or greenish, in axillary and terminal panicled diffuse cymes; bracts often glandular. *Sepals* connate in a globose or hemispheric calyx; lobes 4–6, persistent. *Petals* 4–6, connate in a short or long tubular corolla; lobes triangular, valvate with everted edges. *Stamens* 4–6, adnate to the corolla-tube at various levels (flowers 2–3-morphic); filaments short; anthers linear-oblong. *Carpels* connate in a 2-celled or sometimes a 5–6-celled ovary; ovules many on fleshy, peltate placentas; style short or long, slender or thickened upwards; stigmas 2, or 5–6, linear. *Fruit* a small, globose, fleshy or leathery berry, 2-celled or 5–6-celled, many-seeded; sometimes loculicidally dehiscent on the crown. *Seeds* minute, angular; testa dotted; albumen fleshy; embryo minute.

965. Adenosacme longifolia Wall.; F. B. I. iii. 95.
Chittagong.
A bush with rigid, very brittle branches.

416. Myrioneuron Wall.

Small shrubs with stout branches and spongy bark; *leaves* large; stipules large. *Flowers* white, in large peduncled, terminal, rarely axillary, capitate or corymbose cymes; bracts lanceolate, rigid. *Sepals* connate in an ovoid calyx-tube; lobes 5, lanceolate, rigid, persistent, longer than the corolla. *Petals* 5, connate in a small tubular corolla; throat villous; lobes short, erect, hispid, valvate. *Stamens* 5, adnate to corolla-tube; filaments short, subulate; anthers linear, included. *Carpels* connate in a 2-celled ovary; ovules many, on hemispheric placentas; style short; stigmas 2, linear-oblong, cohering. *Fruit* a white, ovoid, dry or fleshy, 2-celled, many-seeded berry. *Seeds* minute, angular; testa pitted; albumen fleshy; embryo minute.

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Leaves broadly elliptic, abruptly acuminate; nerves 15–20 pairs, nearly horizontal ....*nutans*.

Leaves elliptic-lanceolate, gradually acuminate; nerves 12–15 pairs, very obliquely arched..*Clarkei*.

966. Myrioneuron nutans Wall.; F. B. I. iii. 96.
Chittagong.
A small erect shrub.

967. Myrioneuron Clarkei Hook. f.; F. B. I. iii. 96.
Chittagong.
A small erect shrub.

417. **Hamelia** Jacq.

Shrubs with slender terete branches; *leaves* opposite or whorled, petioled, membranous; stipules interpetiolar, deciduous. *Flowers* in terminal 2–3-chotomous, subscorpioid cymes, rather large, yellow or reddish; bracts minute. *Sepals* connate in an ovoid or turbinate tube; lobes 5, short, erect, persistent. *Petals* 5, connate in a tubular or subcampanulate corolla; tube constricted at the base, slightly 5-angled; throat glabrous; lobes short, triangular, imbricate. *Stamens* 5, adnate to base of corolla-tube; filaments rather short; anthers linear, base bifid, connective appendiculate. *Disk* swollen. *Carpels* connate in a 5-celled ovary; ovules many on axial placentas; style filiform, stigma fusiform, sulcate, slightly twisted. *Fruit* a small, ovoid, 5-locular, many-seeded berry, crowned by the somewhat 5-lobed disk. *Seeds* very small, angular; testa membranous; albumen fleshy; embryo clavate.

968. Hamelia patens Jacq.
A favourite shrub in gardens; often also subspontaneous near villages in C. Bengal.

418. **Gardenia** Linn.

Shrubs or trees, often armed; *leaves* opposite, rarely ternate; stipules intrapetiolar, often connate. *Flowers* often large, terminal or axillary, solitary, fascicled, or rarely cymose, often dimorphic and polygamous. *Sepals* connate in an ovoid or obconic calyx-tube; limb variable, tubular, spathaceous or cleft or lobed, often persistent. *Petals* connate in a tube longer than the calyx-limb; lobes 5–9, contorted. *Stamens* 5–9, adnate to corolla-tube, alternate with the corolla-lobes; anthers included, sessile or nearly so, linear. *Carpels* connate in a 1-celled ovary;

ovules numerous, 2-seriate, on 2–6 parietal placentas; style stout; stigma clavate, fusiform, or 2-fid. *Fruit* a large ovoid, ellipsoid or globose, coriaceous or fleshy berry with a woody endocarp, which sometimes splits vertically along the placentas. *Seeds* many, compressed, embedded in the placenta; testa thin; albumen horny; embryo minute.

Shrubs without spines; stipules connate, large; flowers large, 1 in. or more across, solitary; buds resinous:—
Fruit without ribs; calyx-limb distinctly toothed:—
Calyx-teeth elongated, narrow-lanceolate to subulate; leaves large, up to 8–10 in. long:—
Leaves dull greenish, broadly elliptic or orbicular, obtuse, sometimes ternate, almost sessile; nerves about 12 pairs; calyx-teeth subulate-lanceolate, unequal, recurved; corolla-lobes 5–9, obovate, oblique; fruit globose; placentas 4–5 ....*latifolia.*
Leaves shining, elliptic, obtuse or subacute, distinctly petioled; nerves 20–30 pairs; calyx-teeth narrow-lanceolate; corolla-lobes 5, oblong; fruit ellipsoid or subglobose; placentas 2 ....*lucida.*
Calyx-teeth short, ovate-acute; leaves small, under 3 in. long, shining, obovate, acute or obtuse, sessile; nerves 15–20 pairs; corolla-lobes 5, oblong, obtuse; fruit ellipsoid or oblong; placentas 4–5..*gummifera.*
Fruit distinctly 5-ribbed, ellipsoid; leaves acute:—
Leaves small, ovate; calyx-limb distinctly toothed; teeth subulate; corolla often double ....*florida.*
Leaves large, 6–12 in. long, obovate; calyx-limb obscurely 5-lobed; corolla-lobes 5, broad ....*coronaria.*
Shrubs armed with spinescent, abortive branches; stipules free, very deciduous; flowers small, under 1 in., the females solitary, the males fascicled; buds not resinous:—
Leaves coriaceous; corolla salver-shaped, the tube subcylindric; fruit beaked, ovoid or globose, smooth:—
Leaves elliptic or obovate, glabrous or pubescent beneath ...*turgida.*
Leaves often orbicular, densely tomentose beneath *turgida* var. *montana.*
Leaves membranous; corolla campanulate; fruit not beaked, ellipsoid or subglobose, obscurely 5-ridged ....*campanulata.*

969. GARDENIA LATIFOLIA Ait.; F. I. i. 706; F. B. I. iii. 116; E. D. G. 124.

W. Bengal; Behar; Chota Nagpur.

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A small tree with thick, woody, resinous branchlets. *Hind.* Pápra, ban-pindalu; *Kol.* and *Santal.* Papra, popro; *Uriya* Kota-ranga.

970. GARDENIA LUCIDA Roxb.; F. I. i. 707; F. B. I. iii. 115; E. D. G. 128.
Chittagong.
A small deciduous tree, with resinous shoots. *Hind.* Dikmáli.

971. GARDENIA GUMMIFERA Linn. f.; F. I. i. 709; F. B. I. iii. 116; E. D. G. 116.
Chota Nagpur.
A woody bush with resinous buds. *Hind.* Dikmáli; *Kol.* Barúri.

972. GARDENIA FLORIDA Linn.; F. I. i. 703; F. B. I. iii. 115; E. D. G. 111.
In gardens in many of the provinces.
A shrub. *Vernac.* Gúndha-raj.

973. GARDENIA CORONARIA Ham.; F. B. I. iii. 117; E. D. G. 108. *G. costata* F. I. i. 704.
Chittagong.
A deciduous tree, with resinous buds.

974. GARDENIA TURGIDA Roxb.; F. I. i. 711; F. B. I. iii. 118; E. D. G. 136.
Behar; Chota Nagpur.
A small deciduous tree. *Hind.* Thanella, khurrur, ghurga, mhaner; *Uriya* Bhamenia, dhobelkirat; *Kol.* Karhar, duduri; *Santal.* Dandoukit, dodouki.

974/2. Var. MONTANA F. B. I. iii. 118. *G. montana* F. I. i. 709.
Chota Nagpur.
A small tree.

975. GARDENIA CAMPANULATA Roxb.; F. I. i. 710; F. B. I. iii. 118; E. D. G. 105.
Chota Nagpur, Parasnath; Chittagong.
A shrub.

419. Randia Linn.

Shrubs or trees, unarmed or spinous; *leaves* opposite or with one often arrested; stipules short, intrapetiolar, free or connate. *Flowers* in axillary or leaf-opposed cymes, sometimes fascicled, less often solitary. *Sepals* connate in an ovoid or obovoid or turbinate calyx-tube; limb often tubular; lobes 0 or short, or large and leafy. *Petals* 5, connate in a variously shaped corolla with long or short tube; lobes contorted. *Stamens* 5; anthers narrow, subsessile. *Disk* annular or swollen. *Carpels* connate in a 2-celled, or occasionally a 3–4-celled ovary; ovules usually many, embedded in the placentas; style short or long, slender; stigma fusiform, entire or 2-fid. *Fruit* a globose, ellipsoid or ovoid, usually 2-celled, many-seeded berry. *Seeds* often embedded in pulp, angular; testa thin; albumen horny; embryo axial with rounded, leafy cotyledons.

- Flowers solitary, or if 2–3 on a peduncle (sometimes in *R. dumetorum*), then with a campanulate corolla, small or medium-sized; armed erect species with straight spines:—
    - Corolla campanulate, with a very short tubular base and broad, reflexed, obtuse lobes; calyx-lobes broad, obtuse; flowers usually solitary; berry large, yellow, many-seeded, crowned with the calyx-limb:—
        - Corolla glabrous externally, always solitary, of two kinds, a large sessile form with a ring of hairs inside, and a smaller peduncled, glabrous within; berry 2 in. long; stipules triangular......*uliginosa.*
        - Corolla hairy externally, usually solitary, sometimes 2–3 on one peduncle; berry 1·5 in. long; stipules ovate-acuminate...*dumetorum.*
    - Corolla tubular throughout, long, slender, with oblong, apiculate lobes; flowers in fascicles; calyx-teeth linear; berry small, purple, fusiform, cells about 6-seeded; stipules narrowly lanceolate *fasciculata.*
- Flowers in axillary or leaf-opposed cymes; corolla salver-shaped with slender tube; unarmed species or, if armed, with spines recurved:—
    - Cymes sessile, solitary from upper axil of each branch; cyme-branches spreading; flowers glabrous, shortly pedicelled; corolla-tube much shorter than the lobes; berry smooth, ·5–·6 in. long, many-seeded; an unarmed tree with stout, flexuous branches ....*Wallichii.*
    - Cymes at least shortly peduncled, often from alternate axils of reduced leaves; cyme-branches trichotomous; flowers usually puberulous; corolla-tube much longer than the lobes; berry obscurely ribbed, ·3–·5 in. long, about 8-seeded; a climbing shrub armed with short, reflexed spines or unarmed..*longiflora.*

976. Randia uliginosa DC.; F. B. I. iii. 110; E. D. R. 16. *Posoqueria uliginosa* F. I. i. 712.

W. N. and E. Bengal.

A small, rather rigid tree with thick, woody, 4-angled branches; leaves, except on young shoots, tufted, terminal. Fruit edible, sold in bazars. *Hind.* Pindalu; *Beng.* Piralo; *Uriya* Pendra; *Santal.* Pinde; *Kol.* Pindar, kúmkúm.

977. Randia dumetorum Lamk; F. B. I. iii. 110; E. D. R. 1. *Posoqueria dumetorum* F. I. i. 713. *P. nutans* F. I. i. 714. *P. longispina* F. I. i. 716. *P. floribunda* F. I. i. 719.

In all the provinces.

A small, rather variable tree or rigid shrub with horizontal spines. *Uriya* Pativa; *Beng.* Menphal, madan; *Hind.* Menphal, manyol, karhar; *Rajbans.* Gurol; *Santal.* Loto, boi bindi; *Kol.* Pato, portoho.

978. Randia fasciculata DC.; F. B. I. iii. 109. *Posoqueria fasciculata* F. I. i. 717.

Tirhut; N. Bengal; Chota Nagpur.

A spreading shrub.

979. Randia Wallichii Hook. f.; F. B. I. iii. 113.

Chittagong.

A tree with very stout but flexuous spreading branches.

980. Randia longiflora Lamk; F. B. I. iii. 111. *Posoqueria longiflora* F. I. i. 718.

E. Bengal; Chittagong.

A large climbing glabrous shrub.

420. Petunga DC.

Glabrous shrubs with rigid round branches; *leaves* petioled, narrowed at both ends; stipules triangular or ovate-oblong. *Flowers* small, in axillary spikes, white; bracteoles 2 to each flower. *Sepals* connate in an ovoid calyx-tube; limb minutely 4-toothed, persistent. *Petals* 4, connate in a funnel-shaped tube; throat villous; lobes contorted. *Stamens* 4, adnate to mouth of corolla; anthers subsessile, linear, connective thickened at the tip. *Carpels* connate in a completely or often incompletely 2-celled ovary; ovules 2–8, pendulous from apex of each cell; style filiform, its branches linear, hairy. *Fruit* a small, 2-celled, several-seeded berry. *Seeds* imbricate, with a thick, grooved and folded testa; albumen fleshy; cotyledons linear.

981. Petunga Roxburghii DC.; F. B. I. iii. 120. *Randid racemosa* F. I. i. 525. *R. polysperma* F. I. i. 527.

E. Bengal; Sundribuns.

An evergreen shrub, 5–8 feet high. *Beng.* Pitanga.

421. Hyptianthera W. & A.

A glabrous shrub with terete branches; *leaves* short-petioled; stipules triangular, persistent. *Flowers* small, white, sessile, in axillary fascicles; bracteoles small. *Sepals* connate in a turbinate calyx-tube; lobes 5, acute, persistent. *Petals* 4 or 5, connate in a short corolla; tube hairy within; lobes spreading, contorted. *Stamens* 4 or 5; anthers sessile, oblong, obtuse, pubescent on the back and at the base. *Disk* annular. *Carpels* connate in a 2-celled ovary; ovules 6–10, pendulous from the apex of each cell; style short, included, its arms large, long, erect, hispid. *Fruit* an ovoid or globose berry. *Seeds* compressed, imbricated, angular; testa thick, fibrous and plicate; albumen fleshy; embryo small.

982. HYPTIANTHERA STRICTA W. & A.; F. B. I. iii. 121; E. D. H. 548. *Randia stricta* F. I. i. 526.
Chota Nagpur; W. C. and E. Bengal.
A shrub, 5–10 feet high.

422. Diplospora DC.

Evergreen shrubs or trees, branches terete; *leaves* shortly petioled; stipules triangular, acuminate or lanceolate. *Flowers* small, in short axillary cymes, or fascicled, polygamo-diœcious, white or greenish; bracteoles connate in a cup under the calyx, or free. *Sepals* connate in an obconic or hemispheric calyx-tube; limb truncate or 4–5-toothed or -lobed. *Petals* 4 or 5, connate in a short, cylindric or campanulate corolla; lobes spreading, contorted. *Stamens* 4 or 5; filaments short or long; anthers oblong or linear, often recurved. *Carpels* connate in a 2-celled, rarely a 3-celled ovary; ovules 2–3 in each cell, on septal placentas; style short or long, the stigmatic arms linear or oblong. *Fruit* an ovoid or globose berry. *Seeds* few in each cell; albumen fleshy; embryo small.

983. DIPLOSPORA SINGULARIS Korth.; F. B. I. iii. 123; E. D. D. 672.
Chittagong.
A small tree.

423. Webera Schreb.

Trees or shrubs; *leaves* opposite, petioled; stipules triangular-ovate, usually deciduous. *Flowers* in terminal corymbose cymes,

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sessile or pedicelled; bracteoles 2 under the calyx or, if flowers pedicellate, on the pedicel. *Sepals* connate in an ovoid or turbinate calyx; limb short or long, 5-fid, rarely 4-fid. *Petals* 5. rarely 4, connate in a funnel-shaped or hypocrateriform corolla, with short or long tube and glabrous or villous throat; lobes narrow, usually long, spreading or reflexed, contorted. *Stamens* 5, rarely 4, adnate to mouth of corolla; filaments short or 0; anthers narrow-linear, often acute, exserted. *Carpels* connate in a 2-celled ovary; ovules many, rarely few or paired or solitary in each cell (in our only species ovules solitary); style stout, usually pubescent; stigma long, fusiform, usually far-exserted. *Fruit* a small, globose berry; cells 1- or more-seeded. *Seeds* suborbicular or cup-shaped, rarely angular; albumen fleshy or horny; embryo small; cotyledons leafy.

984. WEBERA CAMPANIFLORA Hook. f.; F. B. I. iii. 106.

Chittagong.

A large bush or small tree. *Beng.* Kankra.

424. Pavetta Linn.

Shrubs or small trees, branches terete; *leaves* opposite, petioled, usually membranous; stipules intrapetiolar, usually connate in a loose, deciduous sheath. *Flowers* in axillary or terminal 2--3-chotomously branched corymbs, rarely capitate; bracteoles small. *Sepals* connate in an ovoid or turbinate calyx; limb short or long, deciduous or persistent; lobes 4, rarely 5. *Petals* 4, rarely 5, connate in a hypocrateriform corolla; tube slender, cylindric; lobes spreading, contorted. *Stamens* 4, rarely 5, adnate to mouth or throat of corolla; filaments long or short or 0; anthers linear. *Disk* fleshy, swollen. *Carpels* connate in a 2-celled ovary; ovules solitary in each cell; placentas prominent on septum; style slender; stigma exserted, fusiform. *Fruit* a small, fleshy berry, with 2 papery, 1-seeded pyrenes. *Seeds* with membranous testa, filling the cell; albumen horny; embryo incurved, with leafy cotyledons.

Leaves glabrous beneath or nearly so; cymes glabrate; corolla glabrous *indica*.

Leaves glabrous or softly or harshly puberulous above, pubescent beneath; cymes tomentose or villous ....*indica* var. *tomentosa*.

985. PAVETTA INDICA Linn.; F. B. I. iii. 150; E. D. P. 338.
Ixora Pavetta F. I. i. 385.

Chittagong.

A small tree. *Beng.* Kukura-chura.

985/2. Var. TOMENTOSA F. B. I. iii. 150. *Ixora tomentosa* F. I. i. 386.

In most of the provinces.

A large bush or small tree. *Beng.* Jui; *Kol.* Sikreba, sikerup; *Santal.* Budhi tilai, budhi ghasit.

425. Ixora Linn.

Shrubs or small trees; branches terete; *leaves* opposite, rarely ternate; stipules interpetiolar. *Flowers* in terminal, 3-chotomously branched, often corymbose cymes; bracteoles 2. *Sepals* connate in an ovoid calyx-tube; limb 4-toothed, very rarely 5-toothed, persistent. *Petals* 4, very rarely 5, connate in a hypocrateriform corolla; tube very long, slender; lobes spreading, contorted. *Stamens* 4, very rarely 5, adnate to the mouth of the corolla; filaments 0 or rarely half as long as the slender anthers, with 2-fid base and often mucronate tip. *Carpels* connate in a 2-celled ovary; ovules solitary, peltate on the septum in each cell; style long, filiform, exserted; stigma fusiform, slender, with 2 rarely quite connate arms. *Fruit* a globose or didymous dryish berry with 2 coriaceous pyrenes. *Seed* almost filling the pyrene, peltate; testa membranous; albumen horny; embryo with thin, flat cotyledons.

Calyx-teeth much longer than ovary; corolla white; flowers in sessile or subsessile cymes..*acuminata.*
Calyx-teeth shorter than or rarely (*I. undulata*) equalling the ovary:—
  Cymes long-peduncled, 6–10 in. long, brachiate; flowers white *spectabilis.*
  Cymes short-peduncled, 2 in. long or less:—
    Cymes not jointed at the ramifications, brachiate; flowers white *parviflora.*
    Cymes jointed at the ramifications:—
      Branches pubescent; cymes brachiate; flowers white ...*cuneifolia.*
      Branches glabrous:—
        Cymes brachiate, with 3–4 slender branches; flowers white:— *undulata.*
        Cymes corymbiform, sessile or subsessile; flowers red or, rarely, yellow:—
          Corolla-lobes acute ....*coccinea.*
          Corolla-lobes rounded ....*stricta.*

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986. IXORA ACUMINATA Roxb.; F. I. i. 383; F. B. I. iii. 137; E. D. I. 511.
Chittagong.
A stout glabrous shrub.

987. IXORA SPECTABILIS Wall.; F. B. I. iii. 141.
Chittagong.
An evergreen tree.

988. IXORA PARVIFLORA Vahl; F. I. i. 383; F. B. I. iii. 142; E. D. I. 515.
In most of the provinces.
An evergreen tree. *Beng.* Rangan; *Hind.* Loha janghia; *Uriya* Tellu, kurwan; *Kol.* Pété; *Santal.* Merom met'.

989. IXORA CUNEIFOLIA Roxb.; F. I. i. 380; F. B. I. iii. 144.
E. Bengal; Chittagong.
A shrub.

990. IXORA UNDULATA Roxb.; F. I. i. 385; F. B. I. iii. 147.
Chota Nagpur and Behar, wild. C. and E. Bengal, in village shrubberies.
A shrub. *Beng.* Palaka-jui.

991. IXORA COCCINEA Linn.; F. I. i. 375; F. B. I. iii. 145; E. D. I. 513. *I. Bandhuca* F. I. i. 376.
Planted in every province; seems wild in Chittagong.
A branching shrub. *Beng.* Rangan, bandhuca (*Sanskr.*).

992. IXORA STRICTA Roxb.; F. I. i. 379; F. B. I. iii. 145.
Planted in most of the provinces.
A branching shrub.

426. **Coffea** Linn.

Shrubs with compressed branches; *leaves* opposite, rarely ternate; stipules broad. *Flowers* axillary, in fascicles or cymes or solitary; bracteoles often connate. *Sepals* connate in a short calyx-tube; limb short, often glandular, regularly 4-toothed or irregularly many-toothed, persistent. *Petals* 4–5, connate in a short or long corolla-tube; lobes spreading, contorted. *Stamens* 4–5; filaments 0; anthers narrow, adnate to corolla-throat or tube, often recurved and contorted. *Carpels* connate in a 2-celled ovary; ovule solitary, peltate on the septum in each cell; style filiform, smooth, with linear or subulate arms. *Fruit* a small drupe with 2 plano-convex or ventrally concave, coriaceous, or cartilaginous pyrenes. *Seeds* plano-convex, concave or grooved on the septal side; albumen horny; embryo short, subbasal; cotyledons thin, cordate.

Leaves dull; branches very slender; flowers appearing when plant is leafless; corolla salver-shaped ....*bengalensis.*
Leaves shining; branches stoutish; flowers with leaves; corolla funnel-shaped ....*arabica.*

993. Coffea bengalensis Roxb.; F. I. i. 540; F. B. I. iii. 153.
Chota Nagpur; N. Bengal; Chittagong.
A small shrub.

994. Coffea arabica Linn.; F. I. i. 539; F. B. I. iii. 153; E. D. C. 1641.
Cultivated sparingly in Chota Nagpur.
A large shrub or small tree. *Hind.* Kahwa; *Beng.* Kava, kapi. The Coffee Plant.

427. **Morinda** Linn.

Erect or climbing shrubs or trees; branches round or 4-angled; *leaves* opposite, rarely ternate; stipules connate, sheathing. *Flowers* axillary or terminal, in simple or panicled or umbelled peduncled heads, the calyces more or less coherent; bracts 0. *Sepals* connate in a short calyx-tube; limb truncate or occasionally with one large, leafy, bract-like lobe. *Petals* 5, less often 4, occasionally 6 or 7, connate in a short or long tubular corolla; lobes coriaceous, valvate. *Stamens* 5, less often 4 or 6–7, adnate to corolla-throat; filaments short; anthers linear or oblong. *Disk* swollen. *Carpels* connate in a 2-celled or spuriously 4-celled ovary; ovules in each cell solitary, ascending from a subbasal placenta on the septum; style slender, stigmatic arms short or long. *Fruit* usually aggregate, of many succulent, enlarged calyces, enclosing numerous cartilaginous or bony, 1-seeded pyrenes, which sometimes cohere into a 2–4-celled putamen; rarely a cluster of nearly discrete drupelets. *Seeds* obovoid or reniform; testa membranous; albumen fleshy or horny; embryo terete.

Leaves tomentose on both surfaces, dull green; corolla pubescent
tinctoria var. *tomentosa.*
Leaves glabrous, shining (sometimes minutely scaberulous in *M. persicæfolia*); corolla glabrous:—
*Calyx-limb with often a foliaceous lobe; fruit greenish [p. 573] *bracteata.*

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Calyx-teeth all similar :—[p. 572]
Flower-heads distinctly peduncled :—
  Stipules obtuse ; corolla-throat hirsute ; fruit whitish ...*citrifolia*.
  Stipules acute ; corolla-throat naked ; fruit purplish...*angustifolia*.
 Flower-heads sessile or subsessile ....*persicæfolia*.

995. MORINDA TINCTORIA Roxb. var. TOMENTOSA ; F. B. I. iii. 156. *M. tinctoria* F. I. i. 543 partly ; E. D. M. 704.
Behar ; Chota Nagpur.
A shrub. *Santal.* Chaili, ban-katari.

996. MORINDA BRACTEATA Roxb. ; F. I. i. 544. *M. citrifolia* var. *bracteata* F. B. I. iii. 156 ; E. D. M. 656.
Sundribuns.
A small tree, near the sea-face. *Beng.* Hardi, haldi-kunch, ronch.

997. MORINDA CITRIFOLIA Linn. ; F. I. i. 541 ; F. B. I. iii. 155 ; E. D. M. 656.
N. Bengal, cultivated.
A small shrub in one form ; in another a woody herb. *Hind.* Al, ak ; *Beng.* Ach.

998. MORINDA ANGUSTIFOLIA Roxb. ; F. I. i. 547 ; F. B. I. iii. 156 ; E. D. M. 652.
Chittagong.
An erect shrub or small tree. *Beng.* Daruharidra.

999. MORINDA PERSICÆFOLIA Ham. ; F. B. I. iii. 157 ; E. D. M. 703.
Chittagong.
A low, diffuse shrub, with slender, flexuous branches.

428. **Canthium** Lamk.

Unarmed or spiny, erect or climbing shrubs ; branches terete ; *leaves* opposite ; stipules connate. *Flowers* small, sometimes polygamous, white or greenish, axillary in fascicles or in peduncled corymbose cymes. *Sepals* connate in a small obconic or turbinate calyx ; limb short, 4–5-toothed, persistent or deciduous. *Petals* 4–5, connate in a funnel-shaped, campanulate or urceolate corolla-tube, with a ring of deflexed hairs inside and with a villous throat ; lobes spreading, at length reflexed, valvate. *Stamens* 4–5, on the throat or mouth of the corolla ; filaments very short or 0 ; anthers oblong or ovate. *Disk* swollen. *Carpels* connate in a 2-celled ovary ; ovules solitary, pendulous in each cell ; style stout ; stigma

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large. *Fruit* a didymous or subglobose, 2-celled drupe, or 1-celled from abortion and reniform or oblong ; pyrenes two, each 1-celled, or one 2-celled, or one 1-celled, the other aborted. *Seeds* oblong ; testa membranous ; albumen fleshy ; embryo elongated with short cotyledons.

Unarmed shrubs ; leaves quite glabrous, as are the branches :—
  Pyrenes more or less wrinkled or tubercled, rounded on the back *didymum.*
  Pyrenes quite smooth, triangular, almost keeled ....*glabrum.*
Armed with decussate, opposite, rarely ternate, sharp axillary or somewhat supra-axillary spines ; pyrenes more or less wrinkled or tubercled ; rounded on the back :—
  Leaves quite glabrous, as are the branches ....*angustifolium.*
  Leaves pubescent on both surfaces ; branches hispid, pubescent *parvifolium.*

1000. Canthium didymum Roxb. ; F. I. i. 535 ; F. B. I. iii. 132 ; E. D. c. 390.
Behar ; Chota Nagpur.
A stout evergreen shrub. *Santal.* Garbha gojha.

1001. Canthium glabrum Bl. ; F. B. I. iii. 133.
N. Bengal, Duars.
A small tree.

1002. Canthium angustifolium Roxb. ; F. I. i. 533 ; F. B. I. iii. 135.
Sundribuns ; Chittagong.
A spreading shrub. *Beng.* Kota-malli.

1003. Canthium parvifolium Roxb. ; F. I. i. 534 ; F. B. I. iii. 135.
Behar ; Chittagong.
A spreading shrub.

429. Vangueria Juss.

Unarmed or spiny erect shrubs ; branches terete ; *leaves* opposite ; stipules connate. *Flowers* small, white or greenish, axillary in fascicles or peduncled cymes, or below the leaves in lateral panicles. *Sepals* connate in a small, obconic or turbinate or globose calyx ; limb erect or spreading, regularly 5- or sometimes 4-lobed, or irregularly 6–10-toothed. *Petals* 5, rarely 4 or 6, connate in a cylindric or urceolate corolla-tube, with a ring of deflexed hairs inside and a villous or glabrous throat ; lobes spreading, at length reflexed, valvate. *Stamens* 5, rarely 4 or 6, on the throat or mouth of the corolla; filaments very short or 0; anthers oblong. *Disk* swollen. *Carpels* connate in a 5-celled, less often 3–4- or 6-celled ovary; ovules solitary, pendulous in each cell; style stout; stigma large. *Fruit* a dry or fleshy drupe or berry, with areolate apex, with 2–6 pyrenes or a 2–6-celled stone. *Seeds* solitary in each pyrene or cell, oblong; testa membranous; albumen fleshy; embryo elongated, with short cotyledons.

Unarmed .... *edulis.*
Armed with straight, opposite or ternate spines:—
  Leaves glabrous or nearly so .... *spinosa.*
  Leaves more or less pubescent or tomentose on both surfaces
    spinosa var. *mollis.*

1004. VANGUERIA EDULIS Vahl; F. B. I. iii. 136; E. D. v. 22.
Cultivated occasionally.
A small tree, native of Madagascar.

1005. VANGUERIA SPINOSA Roxb.; F. I. i. 536; F. B. I. iii. 136; E. D. v. 25.
N. and E. Bengal.
A small tree or large bush. *Vernac.* Moyena.

1005/2. Var. MOLLIS F. B. I. iii. 136.
In all the western provinces.
A small tree.

430. **Psychotria** Linn.

Shrubs or small trees, rarely herbs, erect, rarely twining; *leaves* opposite, rarely 3–4-nately whorled; stipules intrapetiolar, often connate, solitary or in pairs, with often glandular, axillary hairs. *Flowers* in terminal, rarely axillary cymes, heads or fascicles; bracts present or absent. *Sepals* connate in a short calyx-tube; limb usually deciduous. *Petals* 5, rarely 4 or 6, connate in a straight, short corolla-tube; throat naked or hairy; lobes valvate. *Stamens* 5, rarely 4 or 6, on the mouth or throat of the corolla-tube, included or exserted; filaments short or long; anthers oblong or linear. *Carpels* connate in a 2-celled ovary; ovules basal, erect, solitary in each cell; style short; stigmatic arms two. *Fruit* a small ovoid, globose or oblong, rarely didymous drupe with two 1-seeded, plano-convex pyrenes, rarely separating into 2 cocci. *Seeds* plano-convex, the face flat or grooved; testa thin;

albumen hard, sometimes ruminate; embryo small; cotyledons leafy.

1006. PSYCHOTRIA ADENOPHYLLA Wall.; F. B. I. iii. 164.
Chittagong.
A shrub.

431. Lasianthus Jack.

Shrubs, often fœtid; branches terete with compressed nodes; *leaves* opposite, distichous; stipules interpetiolar, usually wide. *Flowers* small, in axillary, rarely peduncled, fascicles, heads or cymes; bracts present or absent. *Sepals* connate in a short ovoid or oblong calyx-tube; limb persistent, short or long, 3–6-toothed, rarely truncate. *Petals* 4–6, connate in a funnel-shaped or hypocrateriform tube; throat villous; lobes spreading, valvate. *Stamens* 4–6, adnate to corolla-throat; filaments short; anthers linear or ovate-oblong, often apiculate. *Carpels* connate in a 4–9-celled ovary; ovules linear, basal, solitary in each cell; style short or long; stigmatic arms 3–9, short, obtuse. *Fruit* a small drupe with 3–9, 3-cornered, 1-seeded pyrenes. *Seeds* narrow; testa membranous; albumen fleshy; embryo cylindric.

Calyx-limb toothed; teeth linear or subulate-lanceolate; flowers in sessile cymes:—
  Stipules ovate, acute; calyx-teeth linear, ciliate; corolla yellowish; bracts ovate-lanceolate, the outer large and leafy; drupes villous, blue, large .... *cyanocarpus*.
  Stipules linear-lanceolate; calyx-teeth subulate-lanceolate; corolla white; bracts subulate; drupes glabrous, small .... *Wallichii*.
Calyx-limb truncate, subentire; stipules triangular, acuminate; flowers subsolitary .... *truncatus*.

1007. LASIANTHUS CYANOCARPUS Jack.; F. B. I. iii. 179.
Chittagong.
An evergreen bush.

1008. LASIANTHUS WALLICHII Wight; F. B. I. iii. 180.
Chittagong.
A shrub.

1009. LASIANTHUS TRUNCATUS Bedd.; F. B. I. iii. 189.
Orissa.
A shrub.

432. Hamiltonia Roxb.

A hispid, erect, 3-chotomously branched undershrub, usually fœtid when bruised; branches terete; *leaves* opposite, petioled; stipules intrapetiolar, short, acute, persistent. *Flowers* small, in broad, terminal, 3-chotomously branched, panicled or subumbellate cymes, sweet-scented; bracts lanceolate; bracteoles subulate. *Sepals* connate in an ovoid calyx-tube; limb persistent; lobes 4–5, valvate. *Petals* 5, connate in a funnel-shaped, elongated corolla; lobes short, valvate. *Stamens* 5, adnate to corolla-throat; filaments short, subulate; anthers obovate-oblong, obtuse. *Carpels* connate in a 5-celled ovary, the outer layer of the common-wall almost free from the inner; ovules basal, erect, solitary in each cell; style filiform; stigmatic arms 5, linear. *Fruit* a partially 5-valved capsule, 1-celled from absorption of septa. *Seeds* 5 or fewer, 3-cornered; testa reticulate, valvate at base; tegmen thick; embryo with cordate, induplicate cotyledons.

1010. Hamiltonia suaveolens Roxb.; F. I. i. 554; F. B. I. iii. 197; E. D. H. 13.
Behar; Chota Nagpur.
A small shrub, 4–12 feet high. *Kol.* Kudia.

433. Pæderia Linn.

Slender, twining shrubs, fœtid when bruised; branches terete, flexuous; *leaves* opposite, rarely ternate, petioled; stipules intrapetiolar, triangular, deciduous. *Flowers* in axillary and terminal, 2–3-chotomously branched, panicled cymes; bracteoles present or absent. *Sepals* connate in an ovoid or turbinate calyx-tube; limb 4–5-toothed, persistent. *Petals* 4 or 5, connate in a tubular or funnel-shaped, pubescent tube, with glabrous or hairy throat; lobes valvate with inflexed, crisped edges, often 3-toothed. *Stamens* 4 or 5, adnate to corolla-tube; filaments 0 or very short; anthers linear-oblong, obtuse. *Carpels* connate in a 2-celled ovary; ovules erect, basal, solitary in each cell; style slender; stigmas 2, capillary, twisted. *Fruit* flattened or globose; epicarp thin, fragile, shining, separating from 2 orbicular or oblong, dorsally compressed, membranous or coriaceous pyrenes. *Seeds* much compressed dorsally; testa thin, adnate to the pyrene; cotyledons large, thin, leafy, cordate.

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Fruit much compressed; pyrenes separating from a filiform carpophore, somewhat winged ....*fœtida*.
Fruit subglobose; pyrenes not separating from a filiform carpophore *tomentosa*.

1011. Pæderia fœtida Linn.; F. I. i. 683; F. B. I. iii. 195; E. D. P. 4.

C. and E. Bengal; Chota Nagpur; Chittagong.

A slender twining shrub. *Hind.* Somraj, gandháli; *Uriya* Gandali; *Beng.* Gandha bhadulia.

1012. Pæderia tomentosa Bl.; F. B. I. iii. 197.

N. Bengal, Duars.

A slender twining shrub.

434. **Knoxia** Linn.

Erect herbs or undershrubs; stems terete or obtusely angled, with 2 lines of hairs; *leaves* opposite; stipules connate with petioles in an entire or bristly sheath. *Flowers* dimorphous, pink or lilac, subsessile on the elongating branches of terminal cymes, rarely spicate; bracteoles 0. *Sepals* connate in an ovoid or didymous calyx-tube; limb persistent; lobes 4, subequal or 1 or 2 longer than the others. *Petals* 4, connate in a corolla with long tube and villous throat; lobes valvate with inflexed tips. *Stamens* 4, adnate to corolla-throat; filaments short; anthers linear, included or exserted. *Carpels* connate in a 2-celled ovary; ovules in each cell solitary, pendulous; style filiform; stigma exserted or included, 2-lobed. *Fruit* small, of 2 semiterete or dorsally compressed, indehiscent, separating cocci. *Seed* with membranous testa and thickened funicle; albumen fleshy; embryo axial.

Leaves petioled; flowers in corymbs of spikes; ripe fruit separating from the persistent columella by a basal perforation ....*corymbosa*.
Leaves sessile; flowers in compound corymbs; ripe fruit falling away bodily with the columella ....*brachycarpa*.

1013. Knoxia corymbosa Willd.; F. B. I. iii. 128. *Spermacoce teres* F. I. i. 367. *S. exserta* F. I. i. 368.

In all the western provinces.

An erect slender annual.

1014. Knoxia brachycarpa Bl.; F. B. I. iii. 130. *Spermacoce lævis* F. I. i. 368.

Chota Nagpur, Parasnath.

An erect strict herb, 2–4 feet high.

435. Hydrophylax Linn. f.

Stout, glabrous, creeping, succulent herbs with terete branches; *leaves* opposite, sessile, ovate-oblong; stipules connate with the petioles in an entire or toothed cup. *Flowers* solitary, axillary, short-pedicelled, lilac. *Sepals* connate in a 4-angled calyx-tube; limb persistent; lobes ovate-lanceolate. *Petals* 4, fleshy, connate in a subcampanulate corolla-tube with a ring of hairs within; lobes ovate, valvate. *Stamens* 4, adnate to corolla-throat; filaments filiform; anthers linear. *Carpels* connate in a 2-celled ovary; ovules solitary, peltately attached to a septal placenta in each cell; style filiform, pubescent; stigma obscurely 2-lobed. *Fruit* large, corky, obovoid-oblong, compressed, curved, acutely 3–4-keeled between the sharp edges, 1–2-celled and 2-seeded. *Seed* linear-oblong, with deeply sulcate face; albumen cartilaginous, adherent to testa; embryo straight, subdorsal.

1015. HYDROPHYLAX MARITIMA Linn. f.; F. I. i. 373; F. B. I. iii. 199.

Orissa, on sand-dunes along the coast.

A creeping succulent herb.

436. Spermacoce Linn.

Herbs or low undershrubs; branches usually quadrate; *leaves* opposite; stipules connate with the petioles in a broad, truncate tooth with marginal bristles. *Flowers* small or minute, solitary or in axillary or terminal fascicles, heads or cymes. *Sepals* connate in an obovoid, turbinate, or obconic calyx-tube; limb persistent or obsolete with 2–4, rarely 5 lobes, and with sometimes intercalary teeth or bristles. *Petals* 4, connate in an infundibular or hypocrateriform corolla; lobes valvate. *Stamens* 4, adnate to tube or throat of corolla; filaments short or long; anthers linear or oblong. *Carpels* connate in a 2-celled ovary; ovules in each cell solitary on septal placentas; style filiform; stigma with 2 short arms or capitate. *Fruit* of 2 coriaceous or crustaceous mericarps, which ultimately dehisce. *Seed* oblong, ventrally grooved; testa thin, often granulate; albumen horny or firmly fleshy; embryo axial with leafy cotyledons.

Stems erect or suberect; stigma subglobose; both halves of capsule dehiscing ventrally after separating septicidally ....*stricta*.

Stems procumbent; style-arms 2; one half of capsule only dehiscing ventrally after separating septicidally, the other remaining closed by the septum ....*hispida*.

GSL

1016. Spermacoce stricta Linn. f.; F. I. i. 370; F. B. I. iii. 200.
Behar; Chota Nagpur.
A herb, usually erect, always annual.

1017. Spermacoce hispida Linn.; F. I. i. 373; F. B. I. iii. 200; E. D. s. 2515.
In all the western provinces.
A herb, always procumbent, often perennial. *Hind.* Madanaghanti; *Santal.* Pitua arak'.

437. Rubia Linn.

Herbs, erect, diffuse or climbing, hispid, scabrid or prickly; stems slender, quadrate; *leaves* in whorls of 4–8; stipules 0; rarely leaves opposite and stipulate. *Flowers* small or minute in axillary and terminal cymes; pedicel jointed under ovary. *Sepals* connate in a globose or ovoid calyx-tube; limb 0. *Petals* 4–5, connate in a rotate, funnel-shaped or shortly campanulate corolla; lobes valvate. *Stamens* 4 or 5, adnate to corolla-tube; filaments short; anthers globose or oblong. *Carpels* connate in a 2-celled ovary; ovules solitary in each cell, erect on septal placentas; style 2-fid or styles 2, short; stigmas capitate. *Fruit* small, fleshy, didymous, or globose by suppression of one carpel. *Seed* suberect, adnate to pericarp; testa membranous; albumen horny; embryo somewhat curved; cotyledons broad, foliaceous.

1018. Rubia cordifolia Linn.; F. B. I. iii. 202; E. D. R. 564. *R. Munjista* F. I. i. 374.
Chota Nagpur, Parasnath.
A climbing herb with perennial root-stock. *Vernac.* Manjíth.

Order LXXI. COMPOSITÆ.

Herbs or shrubs, rarely trees. *Leaves* alternate, rarely opposite or whorled; simple or less often compound; stipules 0. *Flowers* many, small (florets), aggregated in centripetal heads, sessile on the dilated top of the peduncle (receptacle), the heads enclosed in an involucre of 1- or more-seriate, free or connate bracts; bracteoles 0, or reduced to paleate scales or bristles on the receptacle: individual florets all tubular (head discoid), or the outer, or all ligulate (head rayed); all 2-sexual or the inner 2-sexual or male, the outer female or neuter; sometimes diœcious. *Sepals* connate

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in a calyx-tube, adnate to ovary; limb 0, or of hairs (pappus) or scales. *Petals* connate in a corolla of two forms; (*a*) tubular or campanulate, with 4–5-lobed limb; lobes valvate with marginal nerves; (*b*) ligulate with lobes elongated and connate in a strap-shaped or elliptic ligule. *Disk* epigynous. *Stamens* 4–5, inserted within the corolla-tube; filaments usually free; anthers basifixed, usually connate (syngenesious); connective produced; cells simple or tailed at the base; pollen subglobose, rough. *Pistil* an inferior 1-celled ovary; ovule solitary, basal, erect, anatropous, nucleus with one coat; style slender, normally 2-fid, arms (sometimes connate) linear or semi-terete, naked or pubescent externally, or tipped by pubescent cones; margins stigmatic. *Fruit* a dry, indehiscent achene (cypsela). *Seed* erect; testa membranous; albumen 0; embryo straight; cotyledons plano-convex; radicle short.

*Corollas of all the flowers tubular to near the mouth, or if any flatly expanded from a tubular base (ligulate) then only the marginal florets of the flower-head (ray-florets) so expanded; sap not milky:—[p. 587]

†Style-arms long, distinct, or if very short or the style subentire then so only in the sterile flowers of heads with dissimilar (heterogamous) florets:—[p. 587]

‡Flowers red, purple, or white, never yellow; all the florets similar (homogamous) and tubular, or rarely (*Elephantopus*) cleft laterally; involucre of bracts always more than 1-seriate; pappus present, usually setaceous or rarely (*Ethulia*) absent; receptacle naked or rarely (*Ageratum*) paleaceous:—[p. 582]

Anthers cleft at base and appendaged at apex; style-arms subulate, hairy; leaves alternate (VERNONIEÆ):—

Heads distinct, many-flowered:—

Pappus absent; achenes 4–5-angled .... **Ethulia.**

Pappus present; achenes 10-ribbed:—

Pappus short, fugacious .... **Centratherum.**

Pappus long, copious .... **Vernonia.**

Heads 1- or few-flowered, crowded into dense masses like single heads; pappus chaffy .... **Elephantopus.**

Anthers subentire at base, either truncate or appendaged at apex; style-arms obtuse, papillose; leaves opposite (EUPATORIEÆ):—

Anthers truncate at apex .... **Adenostemma.**

Anthers appendaged at apex:—

§Pappus paleaceous; receptacle sometimes paleaceous [p. 582]
Ageratum.

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§Pappus of slender hairs; receptacle always naked:—[p. 581]

Bracts of the involucre several-seriate, numerous **Eupatorium.**

Bracts of the involucre 4, with sometimes a small outer one .... **Mikania.**

‡Flowers, if similar (homogamous) and tubular, yellow; if dissimilar (heterogamous), at least those of the disk yellow; or, if none of the flowers yellow (*Lagascea*, *Emilia*), then with the bracts of the involucre only 1-seriate, rarely (some INULOIDEÆ) flowers purple with bracts many-seriate, but if so, with the heads at least heterogamous:—[p. 581]

¶Anthers appendaged at the apex:—[p. 586]

**Receptacle naked, smooth or foveolate; sometimes when foveolate the edge of the pit fimbriate but not beset with proper paleæ; if paleaceous (*Athroisma*) or pseudopaleaceous (*Cæsulia*) then with the anther-bases produced into tails:—[p. 584]

⊙Bracts of the involucre many-seriate; leaves alternate:—[p. 584]

Anthers subentire at the base; style-arms flattened or plano-convex, all, or at least those of the disk-florets, tipped by a cone (ASTEROIDEÆ); all the flower-heads heterogamous:—

Flower-heads without a proper ray; pappus hardly any or altogether absent:—

Achenes minute, oblong, smooth; pappus absent **Cyathocline.**

Achenes flattened or subterete, with a terminal toothed or bristly pappus-ring .... **Grangea.**

Flower-heads with distinct ray-florets:—

Ray-florets ligulate, never yellow, ligules 2–3-seriate; pappus long, copious .... **Erigeron.**

Ray-florets slender, tubular, or with very short ligules, yellow like those of the disk:—

Pappus long, copious .... **Conyza.**

Pappus short, scanty .... **Thespis.**

Anthers cleft at the base or rarely (*Laggera*) with bases subentire, and if so, with the style-arms of the hermaphrodite florets filiform; style-arms filiform, linear, or obtuse, or those of the sterile florets undivided (INULOIDEÆ):—

+Female florets, if present, filiform:—[p. 583]

×Style-arms of hermaphrodite florets filiform; flower-heads androgynous:—[p. 583]

÷Receptacle naked; bracts of the involucre linear, herbaceous or scarious:—[p. 583]

Flower-heads medium, separate, solitary, in corymbs or panicles, not in globose clusters; or, if clustered (some *Blumeas*), then the achenes with a copious soft pappus:—

Pappus copious, of soft or bristly hairs:—

Herbs; bracts of the involucre narrow; flowers not corymbose:—

Anther-cells tailed at the base, the tails of adjacent anthers confluent ....**Blumea.**

Anther-cells subentire at the base, or if tailed the tails short and not united **Laggera.**

Shrubs; bracts of the involucre broad; flowers corymbose.......................**Pluchea.**

Pappus absent, or represented by only 1–2 rigid scales or bristles ....**Epaltes.**

Flower-heads small, in dense globose or ovoid masses; herbs with winged stems; pappus absent **Sphæranthus.**

÷Receptacle with paleaceous scales; female florets enclosed in the long outer scales of the receptacle or in the inner bracts of the involucre; flower-heads aggregated in dense terminal clusters or short spikes [p. 582] ....**Athroisma.**

× Style-arms of hermaphrodite florets truncate; bracts of the involucre hyaline:—[p. 582]

Flower-heads many-flowered; heads heterogamous, disciform; receptacle naked; hoary or woolly herbs **Gnaphalium.**

Flower-heads 1-flowered; heads homogamous, crowded in pseudo-paleaceous, axillary common receptacles, the bracts of the involucres of individual heads simulating paleæ; glabrous marsh herbs **Cæsulia.**

+Female florets, if present, ligulate; heads heterogamous, but florets usually all fertile, with linear style-arms rounded or dilated at their tips; receptacle naked:—[p. 582]

Achenes faintly ribbed; flowers usually rayed; pappus hairs all slender, those of ray-florets few or none **Vicoa.**

Achenes distinctly ribbed; flowers either rayed or discoid; pappus of outer florets scaly, of inner florets hair-like ....**Pulicaria.**

CSL

⊙Bracts of the involucre 1-seriate, subequal, free or united, with sometimes a few short outer bractlets (calycule) at their base; heads heterogamous or homogamous; anther-cells subentire at the base; receptacle naked:—[p. 582]

Leaves alternate; pappus of fine hairs usually soft and generally copious (SENECIONIDÆ); style-arms of hermaphrodite florets truncate or obtuse, penicillate or with a hairy tip:—

Heads all homogamous; florets (in our species) all purple...**Emilia.**

Heads rayed, heterogamous; florets all yellow...**Senecio.**

Leaves opposite; pappus paleaceous or absent (HELENIOIDEÆ *in part*); style-arms truncate, penicillate or not, or shortly appendaged at tip; heads heterogamous:—

Pappus absent; leaves entire or dentate; heads very small, ray sometimes absent...........................**Flaveria.**

Pappus present, paleaceous; leaves pinnatisect; heads large; flowers showy.......................................**Tagetes.**

**Receptacle paleaceous; anthers subentire at the base; bracts of the involucre 1–many-seriate; heads usually radiate, heterogamous; style-arms truncate or appendaged, or those of the sterile florets entire; pappus of 2–4 awns, or paleaceous, or absent; leaves at the base usually opposite, those higher up opposite or alternate (HELIANTHOIDEÆ):—[p. 582]

Anthers free or nearly so; female florets all apetalous; heads 1-sexual, rarely heterogamous; male florets many in globular heads; bracts of the involucre 1-seriate, free; female florets 2 together, united with the involucre in a prickly burr; pappus 0; leaves all alternate ......**Xanthium.**

Anthers united in a tube:—

Heads 1-flowered, in globose clusters; bracts of the involucre forming a 5-fid tube; lower or all the leaves opposite; villous herbs ....**Lagascea.**

Heads many-flowered:—

††Pappus consisting of only 1–4 bristly awns, or cup-like, or absent:—[p. 586]

Corollas of the fertile florets persistent on the achenes; pappus of 1–3 awns; leaves opposite ....**Zinnia.**

Corollas of all the florets deciduous:—

‡‡Achenes all thick, or those of the ray-florets 3-cornered, and those of the disk laterally compressed; pappus cup-like or composed of 2–3 stiff, chaffy, or bristly awns with or without intermediate smaller

scales, or altogether absent; leaves usually opposite:—[p. 586]

Inner bracts of the involucre embracing and enclosing the achenes of the fertile ray-florets; pappus absent:—

Outer bracts of the involucre 5, glandular **Siegesbeckia.**

Outer bracts of the involucre 4, in two opposite pairs, glabrous ....**Enhydra.**

Inner bracts of the involucre all flat:—

Scales of the receptacle flat, very narrow, usually few; disk-florets 4-toothed; ligules small; pappus absent, or, if present, shortly 2-awned; outer bracts of the involucre numerous **Eclipta.**

Scales of the receptacle concave or complicate, more or less enclosing and embracing the disk-florets:—

Achenes wingless, compressed or 4–5-cornered:—

Pappus united at the base into a ring or cup; flower-heads small or medium; ray-florets fertile:—

Ray-florets white with small ligules; disk-achenes with 2–5 persistent awns; leaves opposite, at least below **Blainvillea.**

Ray-florets yellow, ligules large; disk-achenes with 1–2 short, deciduous awns; leaves all opposite..................**Wedelia.**

Pappus scales or awns free from the base; flower-heads large; ray-florets sterile:—

Awns of the pappus deciduous or persistent, intermediate scales present, persistent; leaves always alternate **Tithonia.**

Awns of the pappus deciduous, often paleaceous, without intermediate scales; leaves alternate or opposite...**Helianthus.**

Achenes of the disk ciliate or winged on the margins, laterally compressed; heads small; leaves always opposite...............**Spilanthes.**

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‡‡Achenes more or less depressed from the top; pappus of 2, rarely 3–4, bristles, or absent :—[p. 584]

Outer bracts of the involucre almost equal, herbaceous; inner bracts separate, almost resembling the scales of the receptacle; ray-florets fertile; leaves opposite :—

Achenes almost 4-cornered, without a pappus, but crowned by the densely pilose base of corolla ....**Guizotia.**

Achenes flat, margins lacerate and winged; pappus present, composed of bristles **Synedrella.**

Outer bracts of the involucre few, small; inner bracts connate below, membranous :—

Style-arms truncate, penicillate, or crowned by a short appendage :—

Leaves alternate, pinnatisect; ray-florets fertile; achenes narrow, flat, long-ciliate, with 2 stiff, smooth, ultimately recurved awns **Glossocardia.**

Leaves opposite, simple to pinnatisect; ray-florets sterile; achenes with 2–4 stiff awns, ultimately finely serrulate on inner side :—

Achenes more or less beaked.........**Cosmos.**

Achenes not beaked......................**Bidens.**

Style-arms ending in a long, shortly hairy appendage; ray-florets fertile :—

Achenes long, crowned with 2–3 stiff, persistent bristles; leaves mostly radical **Glossogyne.**

Achenes without awns; leaves mostly cauline, scattered ....**Chrysanthellum.**

††Pappus of numerous scales; heads radiate; leaves opposite :—[p. 584]

Scales of pappus oblong, chaffy; heads very small **Galinsoga.**

Scales of pappus feathery, fringed; heads medium **Tridax.**

¶Anthers not appendaged at the apex; receptacle (in our species) not paleaceous; pappus absent or reduced to a raised rim, rarely scaly and short; leaves usually alternate (ANTHEMIDEÆ) :—[p. 582]

§Flower-heads radiate; bracts of the involucre rather broad; pappus of short scales sometimes present [p. 587] **Chrysanthemum.**

GSL

§Flower-heads discoid, heterogamous; pappus absent:—[p. 586]

Florets of the circumference very numerous; achenes flat or concave at top; flower-heads spherical or hemispherical:—

Heads peduncled; bracts of the involucre 1–2-seriate **Cotula.**

Heads subsessile:—

Bracts of the involucre 2-seriate, spreading in fruit **Centipeda.**

Bracts of the involucre 3–4-seriate, incurved in fruit **Sphæromorphæa.**

Florets of the circumference few; achenes obovate or rounded at top; flower-heads very small, in racemes or panicles **Artemisia.**

†Style-arms very short, hairy or thickened towards the base, or the style subentire in all the florets, which are similar and tubular to the deeply 5-fid mouth; anther-cells always appendaged at the apex, either subentire or cleft at the base; receptacle usually paleaceous; leaves alternate, generally spinescent (Cynaroideæ):—[p. 581]

Flower-heads 1-flowered; crowded into dense spherical balls; achenes inserted in the straight areoles of the receptacle, silky; leaves and bracts of the involucre spinescent and thistle-like **Echinops.**

Flower-heads many-flowered, separate; achenes glabrous:—

Achenes inserted in the straight areoles of the receptacle:—

Leaves and bracts of the involucre spinescent, thistle-like; pappus-hairs connate at the base into a deciduous ring:—

Filaments free, papillose-hairy; pappus-hairs feathery **Cnicus.**

Filaments connate, glabrous; pappus-hairs simple...**Silybum.**

Leaves and bracts of the involucre unarmed; filaments free:—

Pappus-hairs 1-seriate, feathery, or only a few of the outer ones simple; filaments glabrous.......................**Saussurea.**

Pappus-hairs many-seriate, subpaleaceous; filaments hairy **Goniocaulon.**

Achenes inserted in the very oblique or quite lateral areoles of the receptacle; leaves and bracts of the involucre spinescent:—

Bracts of the involucre without any whorl of outer leafy bracts (calycule); pappus many-seriate, bristly except the flattened innermost..**Volutarella.**

Bracts of the involucre with a distinct whorl of spinescent, leafy bracts at their base; pappus (in our species) wanting **Carthamus.**

*Corollas of all the florets flatly expanded from a tubular base (ligulate);

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ligules 5-toothed; anthers cleft at base, rarely appendaged at apex; leaves radical or alternate; stem always herbaceous, fistulose; sap milky (CICHORIEÆ):—[p. 581]

Pappus of scales, with sometimes alternating hairs, or pappus absent; achenes truncate; florets blue..**Cichorium.**

Pappus of hair-like bristles, at least in the central florets of the heads; florets yellow:—

Pappus-hairs feathery; achenes contracted at both ends, ribbed, rugose ....**Picris.**

Pappus-hairs simple:—

Achenes beaked and also contracted at the base, ribbed; ribs rugose or smooth:—

Achenes fusiform or oblong, rarely shortly cylindric, often slender, glabrous, or puberulous ....**Crepis.**

Achenes compressed or flattened, ovoid, oblong, or narrow **Lactuca.**

Achenes not beaked:—

Achenes narrowed at base, truncate at apex:—

Achenes oblong with 4–5 rugose ribs ....**Picridium.**

Achenes compressed, many-ribbed; ribs smooth or rugose **Sonchus.**

Achenes truncate at base as well as at apex ....**Launea.**

438. Ethulia Linn.

Branching herbs; *leaves* alternate, penninerved, serrate. *Flower*-heads small, homogamous; involucre subcampanulate; bracts many-seriate, imbricate; receptacle flat, naked. *Calyx*-limb 0. *Petals* 5, connate in equal, regular, slender, tubular corollas; limb campanulate; lobes narrow. *Stamens* 5, syngenesious; anthers obtusely auricled. *Style* with subulate, puberulous arms. *Cypsela* glandular between the prominent 4–6 ribs; areole broad with a callous ring; pappus 0.

1019. ETHULIA CONYZOIDES Linn.; F. B. I. iii. 227. *E. ramosa* F. I. iii. 413.

E. Bengal; Tippera.

An erect, glabrous or puberulous leafy annual.

439. Centratherum Cass.

Branching herbs, erect or diffuse; *leaves* alternate, petioled, toothed. *Flower*-heads homogamous; involucre subhemispheric; bracts many-seriate, inner dry or scarious, outer herbaceous, often leafy; receptacle flat, naked or pitted. *Calyx*-limb short. *Petals* connate in equal, regular, slender, tubular corollas; limb campanulate; lobes narrow. *Stamens* 5, syngenesious; anthers obtusely auricled. *Style* with subulate, puberulous arms. *Cypsela* obtuse, 8–10-ribbed; pappus short, scabrid, fugacious.

1020. Centratherum anthelminticum O. Kuntze. *Serratula anthelmintica* F. I. iii. 405. *Vernonia anthelmintica* F. B. I. iii. 236; E. D. v. 73.

In most of the provinces.

A tall, robust, leafy annual. *Vernac.* Sómraj.

440. **Vernonia** Schreb.

Herbs or shrubs, sometimes climbing, or small trees; *leaves* alternate, entire or toothed. *Flower*-heads terminal or axillary, solitary, cymose or paniculate, homogamous; involucre ovoid, globose, or hemispheric, as long as the flowers or shorter; bracts many-seriate, the innermost longest; receptacle naked or pitted or sometimes shortly hairy. *Calyx*-limb of biseriate setæ. *Petals* 5, connate in equal, regular, slender, tubular corollas; limb campanulate or narrow; lobes narrow. *Stamens* syngenesious; anthers with obtusely auricled base. *Style* with subulate, puberulous arms. *Cypsela* striate, ribbed or angled, rarely terete; pappus of many hairs, often girt with a row of outer short hairs or flattened bristles.

Heads large, half an inch across or more, few:—
  Heads 30–50-flowered, solitary and axillary or few and terminal, subsessile; achenes silky on, as well as between, the ribs ....*teres*.
  Heads several, peduncled; achenes glabrous or sparsely hairy:—
    Heads 10–15-flowered, in small, short, axillary corymbs; peduncles slender; achenes quite glabrous ....*Thomsoni*.
    Heads 30-flowered, in rather large corymbs; peduncles stout:—
      Achenes quite glabrous ....*bracteata*.
      Achenes sparsely hairy between the glabrous ribs ......*Roxburghii*.
Heads small, under a quarter of an inch across:—
  Annual; achenes terete, neither ribbed nor angled ....*cinerea*.
  Perennial; achenes 10-ribbed, glabrous:—
    Bracts of the involucre obtuse ....*divergens*.
    Bracts of the involucre acute..*saligna*.

1021. Vernonia teres Wall.; F. B. I. iii. 229.

Behar; Chota Nagpur.

A rigid undershrub with simple, terete stems.

1022. VERNONIA THOMSONI Hook. f.; F. B. I. iii. 232.
Chittagong.
A straggling much-branched undershrub.

1023. VERNONIA BRACTEATA Wall.; F. B. I. iii. 232.
N. Bengal, Duars.
A rigid, sparingly branched undershrub.

1024. VERNONIA ROXBURGHII Less.; F. B. I. iii. 232. *Eupatorium asperum* F. I. iii. 415.
Behar; Chota Nagpur.
A rigid, sparingly branched undershrub.

1025. VERNONIA CINERERA Less.; F. B. I. iii. 233; E. D. v. 79. *Serratula cinerera* F. I. iii. 406.
In all the provinces.
An erect, rarely decumbent, annual weed. *Beng.* Kúkshim, kala-jhira; *Santal.* Darya arak', birlopong arak', jhurjhuri.

1026. VERNONIA DIVERGENS Benth.; F. B. I. iii. 234. *Eupatorium divergens* F. I. iii. 415.
Chota Nagpur.
A stout, sparingly branched undershrub.

1027. VERNONIA SALIGNA DC.; F. B. I. iii. 235.
Chittagong.
A coarse, leafy undershrub.

441. Elephantopus Linn.

Rigid herbs; *leaves* alternate or radical, entire or toothed. *Flower*-heads 2–5-flowered, homogamous; involucre compressed; bracts about 8, dry, stiff, alternately flat and conduplicate; receptacle naked. *Calyx*-limb bristly. *Petals* 4, connate in similar, equally 4-lobed corollas, cleft on one side and with the lobes palmately spreading. *Stamens* syngenesious; anthers obtusely auricled at base. *Style* with subulate, minutely puberulous arms. *Cypsela* truncate, 10-ribbed; pappus of rigid, shining bristles, slender throughout or dilated and chaffy below.

1028. ELEPHANTOPUS SCABER Linn.; F. I. iii. 445; F. B. I. iii. 242; E. D. E. 80.
In all the provinces.
A rigid, dichotomously branched, scabrid herb. *Hind.* Samdulun; *Beng.* Samdulur; *Santal.* Manjurjuti.

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442. **Adenostemma** Forst.

Herbs, glabrous or glandular-pubescent; *leaves* opposite, petioled. *Flower*-heads homogamous, corymbose; involucre campanulate; bracts many, sub-2-seriate, narrow, herbaceous, sometimes connate; receptacle flat, naked. *Calyx*-limb annular with few hairs. *Petals* 5, connate in equal, regular, short-tubed corollas with campanulate limb. *Stamens* syngenesious; anthers truncate with glandular tip and obtuse base. *Style* with elongated arms dilated above. *Cypsela* obtuse, 5-ribbed, glandular; pappus of 3–5 short, rigid, often clavate hairs set on a shallow ring.

1029. ADENOSTEMMA VISCOSUM Forst; F. B. I. ii. 242. *Ageratum aquaticum* F. I. iii. 415.

In all the provinces.

An erect, rather slender annual. *Beng*. Buro-keshuti.

443. **Ageratum** Linn.

Erect herbs or shrubs; *leaves* opposite or the uppermost sometimes alternate. *Flower*-heads homogamous, corymbose or paniculate; involucre campanulate; bracts 2–3-seriate, linear, subequal; receptacle nearly flat, naked, or with caducous scales. *Calyx*-limb of free or connate scales. *Petals* 5, connate in equal, regular, tubular corollas; limb equally 5-cleft. *Stamens* syngenesious; anthers appendiculate with obtuse bases. *Style* with long, obtuse arms. *Cypsela* 5-angled; pappus of 5 short, free or connate, subequal, or of 10–20 narrow, unequal scales.

1030. AGERATUM CONYZOIDES Linn.; F. B. I. iii. 243. *A. cordifolium* F. I. iii. 415.

In all the provinces.

An annual herb. *Beng*. Oochunti.

444. **Eupatorium** Linn.

Herbs, undershrubs or shrubs; *leaves* opposite, rarely alternate. *Flower*-heads homogamous, corymbose; involucre oblong, ovoid, campanulate or hemispheric; bracts long or short, few- or many-seriate, subequal or the outer shorter; receptacle naked. *Calyx*-limb with a row of hairs. *Petals* 5, connate in equal, slender, regular, tubular corollas; limb 5-lobed or -toothed. *Stamens* syngenesious; anthers appendaged with obtuse bases. *Style* with long, obtuse arms. *Cypsela* truncate, 5-angled or 5-ribbed; pappus-hairs 1-seriate, numerous, rigid, scabrid.

Flower-heads in lax racemes; leaves lanceolate, the base gradually tapering to a short petiole; margins subentire ....*Ayapana.*
Flower-heads rather closely corymbose; leaves ovate-acuminate, the base abruptly tapering to a distinct petiole; margins coarsely serrate *odoratum.*

1031. EUPATORIUM AYAPANA Vent.; F. B. I. iii. 244; E. D. E. 490.
Cultivated in C. and E. Bengal.
A herb. *Vernac.* Ayapana (*from its American name*).

1032. EUPATORIUM ODORATUM Linn.; F. B. I. iii. 244.
Cultivated sparingly in C. and E. Bengal.
A coarse herb.

445. Mikania Willd.

Herbs or shrubs, twining or rarely erect; *leaves* opposite, petioled. *Flower*-heads small, homogamous, usually 4-flowered, spicate, racemose, or paniculate; involucre oblong; bracts 4, narrow, with often a smaller outer one; receptacle narrow, naked. *Calyx*-limb often shortly annular, of connate hairs. *Petals* 5, connate in equal, regular, slender, tubular corollas; limb campanulate, 5-fid. *Stamens* syngenesious; anthers appendiculate, with obtuse bases. *Style* with long, acute arms. *Cypsela* truncate, 5-angled; pappus-hairs many, 1–2-seriate, often connate at the base.

1033. MIKANIA SCANDENS Willd.; F. B. I. iii. 244.
C. Bengal, locally quite naturalised.
A twining herb with long-petioled, opposite leaves.

446. Cyathocline Cass.

Erect, annual, scented herbs; *leaves* alternate, pinnatisect. *Flower*-heads small, heterogamous, not rayed, paniculate; outer florets female, many-seriate, fertile; disk-florets hermaphrodite, but usually sterile; involucre hemispheric; bracts sub-2-seriate, lanceolate, acute, with scarious margins; receptacle elevated with a contracted base and naked concave top. *Calyx*-limb 0. *Petals* of female florets connate in filiform corollas, rather shorter than style, with 2-toothed limb; of hermaphrodite florets connate in regular tubular corollas, with narrowly campanulate, 5-fid limb. *Stamens* syngenesious; anthers with truncate, entire, or subentire base. *Style* in hermaphrodite florets simple or cleft, papillose. *Cypsela* minute, oblong, smooth; pappus 0.

1034. Cyathocline lyrata Cass.; F. B. I. iii. 246.
Behar; W. Bengal; Chota Nagpur; Chittagong.
An annual herb.

447. **Grangea** Forsk.

Herbs, suberect or prostrate, villous; *leaves* alternate, pinnatifid. *Flower*-heads heterogamous, not rayed, terminal or leaf-opposed, subglobose, yellow; outer florets female, 1- or more-seriate; disk florets hermaphrodite, all fertile; involucre wide-campanulate; bracts few-seriate, outer herbaceous; receptacle convex or conical, naked. *Calyx*-limb annular. *Petals* of female flower connate in filiform corollas, shorter than the styles, the outermost with 2-fid, the inner with sometimes 3–4-fid limb; of hermaphrodite connate in regular, slender, tubular corollas, with campanulate, 4–5-cleft limb. *Stamens* syngenesious; anthers obtuse at base. *Style* of hermaphrodite flowers with flattened, cuneate arms, obtuse or with short, triangular, apical appendages. *Cypsela* somewhat flattened; pappus cupular, cartilaginous, with fimbriate or nearly naked margin.

1035. Grangea maderaspatana Poir.; F. B. I. iii. 247; E. D. G. 660. *Artemisia maderaspatana* F. I. iii. 412.
In all the provinces.
A prostrate weed, forming patches 6 in. to a foot wide.
Hind. Mastaru; *Beng.* Namuti.

448. **Erigeron** Linn.

Annual or perennial herbs, with *leaves* all radical and 1-headed scapes, or with slender, erect or decumbent, much-branched stems with alternate leaves. *Flower*-heads heterogamous, rayed, solitary or corymbose or paniculate; ray-florets female, 2- or more-seriate, fertile; disk-florets hermaphrodite, fertile, or rarely sterile; involucre hemispheric or campanulate; bracts sub-2-seriate, numerous, narrow; receptacle nearly flat, naked, or occasionally pitted or minutely paleaceous. *Calyx*-limb with hairs or bristles. *Petals* of female florets all connate in narrow, ligulate corollas, or the inner female florets sometimes filiform with subentire limb; of hermaphrodite florets 5, rarely 4, connate in regular tubular corollas, with a very shortly 5-, rarely 4-toothed limb. *Stamens* syngenesious; anthers with entire, almost obtuse bases. *Style* of hermaphrodite florets with more or less flattened arms, with triangular or oblong, apical, acute or obtuse appendages. *Cypsela* compressed, usually narrow, margins often nerviform; pappus a single or double row of bristles, the outer, when present, of fewer and shorter setæ.

1036. ERIGERON ASTEROIDES Roxb.; F. I. ii. 432; F. B. I. iii. 254; E. D. E. 276.

In most of the provinces.

A coarse annual, 1–2 feet high.

449. Conyza Less.

Herbs; *leaves* entire, toothed, or less often pinnately divided. *Flower*-heads heterogamous, disciform, corymbose or panicled, rarely solitary; outer flowers female, pale, 2–many-seriate, inner hermaphrodite, yellow, all or mostly fertile; involucre campanulate; bracts 2–many-seriate, narrow, the outermost smallest; receptacle flat or convex, naked or pitted and fimbriate. *Calyx*-limb bristly. *Petals* of female florets connate in filiform corollas, shorter than the styles, with 2–3-toothed limb, or occasionally the very outmost cleft on one side above and shortly narrowly ligulate; of hermaphrodite florets 5, connate in regular, tubular corollas, with slightly inflated, shortly 5-toothed limb. *Stamens* syngenesious; anthers with obtuse, entire base. *Style* of hermaphrodite florets with flattened arms, apical appendages lanceolate, short or long. *Cypsela* minute, compressed; pappus slender, 1-seriate, rarely 2-seriate, with the outer setæ shorter.

Pappus white; stems little branched; bracts of the involucre slender, linear; leaves obovate-spathulate or oblanceolate, the margins obtusely or acutely lobed or cut; achenes glandular ....*semipinnatifida.*

Pappus reddish; stems much branched; bracts of the involucre rather firm, lanceolate:—

Leaves lanceolate, narrowed to both ends, the margins entire or serrate; bracts of the involucre with scarious margins; achenes glabrous ....*viscidula.*

Leaves from narrow-linear to spathulate-obovate, entire, toothed or rarely pinnatifid; bracts of the involucre herbaceous; achenes puberulous ....*stricta.*

1037. CONYZA SEMIPINNATIFIDA Wall.; F. B. I. iii. 257.

E. Bengal; Sundribuns.

A stout-stemmed annual herb.

1038. CONYZA VISCIDULA Wall.; F. B. I. iii. 258.
Behar; N. Bengal; Chittagong.
A much-branched, viscidly hairy herb.

1039. CONYZA STRICTA Willd.; F. B. I. iii. 259. *C. pinnatifida* F. I. iii. 430.
Behar; Chota Nagpur.
A fastigiately branched, pubescent herb.

450. **Thespis** DC.

A branching, glabrous, annual herb; *leaves* alternate, toothed. *Flower*-heads minute, heterogamous, disciform, yellow, sessile, in globose clusters on the branches of dichotomous cymes; outer florets many-seriate, female, fertile, often apetalous; inner florets hermaphrodite, few, sterile; involucre hemispheric; bracts sub-2-seriate, wide, obtuse, herbaceous with scarious margins; receptacle flat or slightly convex, naked. *Calyx*-limb subpaleaceous. *Petals* of female florets 0, or connate in very short, tubular corollas; of hermaphrodite florets 4, connate in regular, shortly tubular corollas, with narrowly campanulate, shortly 4-fid limb. *Stamens* syngenesious; anthers obtuse, entire or slightly emarginate. *Style* of hermaphrodite florets with short, flattened, subacute arms, papillose on the back. *Cypsela* of female florets small, hardly costate, of hermaphrodite abortive; pappus-hairs about 10, 1-seriate, short, dilated.

1040. THESPIS DIVARICATA DC.; F. B. I. iii. 259.
E. Bengal; Tippera.
A robust weed with spreading branches.

451. **Blumea** DC.

Annual or perennial, glandular-pubescent or woolly herbs; *leaves* alternate, usually toothed or lobed. *Flower*-heads heterogamous, disciform, purple, rosy or yellow, corymbose, panicled or fascicled, rarely racemed; outer florets female, many-seriate; inner florets hermaphrodite, few, all fertile; involucre ovoid or campanulate; bracts many-seriate, narrow, acute, soft or herbaceous, the outer smaller; receptacle flat, naked. *Calyx*-limb bristly. *Petals* of female florets connate in filiform corollas, shorter than their styles, with minutely 2–3-toothed apex; of hermaphrodite florets 5, connate in regular, slender, tubular corollas, with slightly enlarged 5-toothed limb. *Stamens* syngenesious; anthers sagittate at the base, with small, slender tails.

Style of hermaphrodite florets with flattened or almost filiform arms, obtuse or acute, papillose on the back. *Cypsela* small, subterete or angled, ribbed or not; pappus 1-seriate, slender, often caducous.

*Herbs :—[p. 597]

Heads solitary and peduncled on the ends of the branches, or few corymbose; flowers yellow; receptacle glabrous:—

Lobes of the hermaphrodite corollas hairy; flowers all solitary :—

Pappus reddish; leaves dentate, all alternate ....*amplectens.*

Pappus white; leaves serrate, the two uppermost leaves on the branchlets opposite ....*bifoliata.*

Lobes of the hermaphrodite corollas glabrous; flowers solitary peduncled, or few corymbose; pappus white; leaves all alternate, spinulose-toothed ....*oxyodonta.*

Heads numerous; pappus white :—

†Heads more or less clustered to form dense, oblong spikes or contracted panicles at the top of the stem :—[p. 597]

Corolla purplish; stem erect, subsimple, very leafy; leaves obovate, irregularly toothed or serrate; receptacle glabrous; achenes sparsely hairy, 4–5-angled, not ribbed; pubescence silky, sometimes glandular, never silvery..........................*Wightiana.*

Corolla yellow :—

Leaves elongate, oblanceolate, or linear-acuminate, minutely toothed; pubescence silvery-silky; heads grey, silvery, in crowded axillary and terminal clusters; receptacle glabrous; lobes of hermaphrodite corolla hairy; achenes silky ...*sericans.*

Leaves broadly obovate, oblong or elliptic, coarsely toothed; pubescence never silvery :—

Heads with purplish bracts to the involucre, in small, sessile, axillary clusters along the slender branches of the much-branched stem; lower leaves serrate or lyrate-pinnatifid, upper oblong incised; receptacle pubescent; lobes of hermaphrodite corolla hairy; achenes distinctly 8–10-ribbed, glabrous or hairy...*glomerata.*

Heads with greyish bracts to the involucre, collected in dense terminal panicles, rarely corymbose at the apex of the simple or sometimes (in *B. lacera*) sparingly branched stem; lower leaves not lyrate-pinnatifid; receptacle glabrous; lobes of hermaphrodite corolla glabrous or nearly so; achenes angled but not distinctly ribbed :—

Stems sometimes branched, always very leafy; pubescent, often glandular, rarely glabrescent; lower leaves toothed

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or serrate, rarely lobulate, upper toothed; achenes glabrate, subtetragonous ....*lacera.*

Stems always simple, with few leaves, often scapiform; densely villous or silky; achenes hairy ....*hieracifolia.*

†Heads in open corymbs or panicles with divaricate branches; corolla always yellow; achenes always 8–10-ribbed, more or less hairy:— [p. 596]

Stems branched from the base; pubescent or laxly tomentose herbs, with the lower leaves runcinate, lyrate, or subpinnatifid; bracts of involucre grey-green:—

Leaves on upper part of stem few, large, laciniate; receptacle pubescent; lobes of hermaphrodite corolla hairy; achenes silky *laciniata.*

Leaves on upper part of stem many, small, toothed; receptacle glabrous; lobes of hermaphrodite corolla glandular; achenes beset with spreading hairs ....*membranacea.*

Stem simple below, branched above; a villous herb with spreading soft hairs, the lower leaves obovate, lanceolate, coarsely irregularly serrate, upper toothed or lacerate; bracts of involucre coloured; receptacle pubescent; achenes silky.......................*Jacquemontii.*

*Shrubs or small trees; flowers yellow; pappus red; heads many:— [p. 596]

A shrub, with stout, glabrous or puberulous branches; leaves papery, glabrous, oblanceolate, acuminate ....*myriocephala.*

A small tree, with stout, villous, or silkily woolly stem and branches; leaves coriaceous, silkily woolly, elliptic- or oblong-lanceolate, with a short, usually auricled petiole ....*balsamifera.*

1041. BLUMEA AMPLECTENS DC.; F. B. I. iii. 260.

C. Bengal; Sundribuns.

A small bushy herb.

1042. BLUMEA BIFOLIATA DC.; F. B. I. iii. 261. *Conyza bifoliata* F. I. iii. 431.

C. Bengal.

A small bushy herb.

1043. BLUMEA OXYODONTA DC.; F. B. I. iii. 266.

In all the western and northern provinces.

A slender decumbent herb.

1044. BLUMEA WIGHTIANA DC.; F. B. I. iii. 261.

In all the provinces.

An erect herb.

1045. BLUMEA SERICANS Hook. f.; F. B. I. iii. 262.

Chittagong.

A tall robust herb.

1046. BLUMEA GLOMERATA DC.; F. B. I. iii. 262. *Conyza fistulosa* F. I. iii. 429.
In all the provinces.
An erect, rather slender, much-branched herb.

1047. BLUMEA LACERA DC.; F. B. I. iii. 263; E. D. B. 546. *Conyza lacera* F. I. iii. 428.
In all the provinces.
An erect herb. *Hind.* Kukkurbanda; *Beng.* Kukursunga, bara-suksung, bara-koksing.

1048. BLUMEA HIERACIFOLIA DC.; F. B. I. iii. 263.
Chittagong.
A robust or slender, simple herb, with often scape-like stems.

1049. BLUMEA LACINIATA DC.; F. B. I. iii. 264. *Conyza laciniata* F. I. iii. 427.
In all the provinces.
A tall erect herb.

1050. BLUMEA MEMBRANACEA DC.; F. B. I. iii. 265. *Conyza diffusa* F. I. iii. 429.
In all the provinces.
A tall, erect, usually much-branched herb.

1051. BLUMEA JACQUEMONTII Hook. f.; F. B. I. iii. 265.
Chota Nagpur.
A tall coarse herb.

1052. BLUMEA MYRIOCEPHALA DC.; F. B. I. iii. 269. *Conyza lanceolaria* F. I. iii. 432.
Chittagong.
A shrub, stems as thick as a finger.

1053. BLUMEA BALSAMIFERA DC.; F. B. I. iii. 270; E. D. B. 540. *Conyza balsamifera* F. I. iii. 427.
Tippera; Chittagong.
A small tree-like shrub. *Hind.* Kakaróndá.

452. **Laggera** Sch.-Bip.

Annual or perennial herbs; *leaves* alternate, often rigid and decurrent. *Flower*-heads heterogamous, disciform, yellow, panicled or axillary; outer florets female, many-seriate, inner hermaphrodite, many-seriate; all fertile; involucre campanulate; bracts many-seriate, narrow, often rigid, the outer shorter; receptacle flat, naked. *Calyx*-limb setose. *Petals* of female florets

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connate in filiform corollas, with minutely toothed mouth; of hermaphrodite 5, connate in regular, slender, tubular corollas, with slightly enlarged 5-fid limb. *Stamens* syngenesious; anthers 2-lobed or sagittate at base, but not tailed. *Style* of hermaphrodite florets with flattened or almost filiform arms. *Cypsela* small, subterete or angled, ribbed or not; pappus 1-seriate, slender, often caducous.

Florets yellow; stems very slender, not winged; leaves half-embracing the stem at their base .... *flava*.
Florets purplish or pink; stems rather robust, more or less winged; leaves decurrent on the stem at their base:—
  Leafy wings of the stem all entire and continuous .... *alata*.
  Leafy wings of the stem not entire and continuous:—
    Wings extending throughout the stem but deeply toothed, lobed and interrupted; leaves entire at base .... *pterodonta*.
    Wings very shortly decurrent from the leaves, which are auricled at the base .... *aurita*.

1054. LAGGERA FLAVA Benth.; F. B. I. iii. 270.
In all the provinces.
A slender herb, 6 in. to 3 feet high.

1055. LAGGERA ALATA Sch.-Bip.; F. B. I. iii. 271. *Conyza alata* F. I. iii. 430.
N. Bengal; Chota Nagpur.
A stout leafy herb.

1056. LAGGERA PTERODONTA Benth.; F. B. I. iii. 271.
Chota Nagpur, rare.
A slender herb.

1057. LAGGERA AURITA Sch.-Bip.; F. B. I. iii. 271; E. D. L. 65. *Conyza aurita* F. I. iii. 428.
In all the provinces.
A slender herb.

453. Pluchea Cass.

Shrubs, rarely herbs, tomentose or glutinous; *leaves* alternate. *Flower*-heads heterogamous, disciform, white, yellow, or lilac, small, in terminal leafless corymbs or large and subsolitary; outer florets female, many-seriate, fertile; inner florets hermaphrodite, few, sterile; involucre ovoid or campanulate; bracts ovate, usually broad, dry, rigid; receptacle flat, naked. *Calyx*-limb setose. *Petals* of female florets connate in filiform corollas, shorter than their styles, 3-fid or minutely toothed at the apex; of hermaphrodite florets 5, connate in regular tubular corollas, with slightly enlarged 5-fid limb. *Stamens* syngenesious; anthers with sagittate bases, the cells tailed. *Style* of hermaphrodite florets with filiform, entire or 2-fid arms. *Cypsela* small, 4–5-angled; pappus-hairs slender, 1-seriate, rigid, free, or in sterile florets many and connate.

1058. PLUCHEA INDICA Less; F. B. I. iii. 272; E. D. P. 961.
Conyza corymbosa F. I. iii. 426.
Sundribuns.
A low shrub, growing in salt marshes and mangrove swamps. *Beng.* Munjhú rukha, kukronda.

454. Epaltes Cass.

Herbs; *leaves* alternate, usually decurrent. *Flower*-heads heterogamous, disciform, small, solitary or corymbose; outer florets female, many-seriate, fertile; inner florets hermaphrodite, very few, usually sterile; involucre broadly campanulate or hemispheric; bracts many-seriate, dry, rigid; receptacle flat or convex and raised, naked. *Calyx*-limb 0. *Petals* of female florets connate in filiform corollas, shorter than their styles, sometimes subcartilaginous below, minutely 2–3-toothed at the tip; of hermaphrodite connate in regular tubular corollas, with slightly enlarged or campanulate 3–5-fid limb. *Stamens* syngenesious; anthers sagittate at base, minutely auricled, auricles connate, tails small. *Style* of hermaphrodite florets subulate, entire or 2-fid. *Cypsela* of female florets subterete, 5–10-ribbed; pappus 0; of hermaphrodite usually abortive, with or without 2–3 caducous pappus-hairs.

1059. EPALTES DIVARICATA Cass.; F. B. I. iii. 274.
Orissa; sand-dunes near margin of Chilka lake.
An annual, diffuse, glabrous herb.

455. Sphæranthus Linn.

Low annual herbs with spreading branches; *leaves* alternate, toothed, decurrent. *Flower*-heads small, heterogamous, disciform, in terminal, solitary, globose clusters, with usually an involucre of a few empty bracts, sessile on a common receptacle and bracteate or not; outer florets few or many, female, fertile, inner solitary or few, hermaphrodite, fertile or sterile; involucre narrow; bracts narrow, acute, dry, unequal; receptacle small, naked. *Calyx*-limb obsolete. *Petals* of female florets connate in filiform, minutely 2–3-toothed corollas; of hermaphrodite florets connate in regular corollas, with thickened tube and 4–5-toothed limb. *Stamens* syngenesious; anthers sagittate at base; auricles acute or tailed. *Style* of hermaphrodite florets with filiform arms, or entire. *Cypsela* oblong, subcompressed; pappus 0.

Clusters of heads small on glabrous peduncles with entire wings; bracts of the involucre scarious, often jagged at tips......................*africanus*.
Clusters of heads larger on pubescent peduncles with toothed wings; bracts of the involucre tapering into a subulate, ciliate point......*indicus*.

1060. Sphæranthus africanus Linn.; F. B. I. iii. 275. *S. indicus* F. I. iii. 446.

C. and E. Bengal; Sundribuns.

A slender, usually glabrous herb; in swamps.

1061. Sphæranthus indicus Linn.; F. B. I. iii. 275; E. D. S. 2518. *S. mollis* F. I. iii. 446.

In all the provinces.

A villous weed; common in rice-fields. *Hind.* Mundi; *Beng.* Ghork-mundi, chaggul-nadi, murmuria; *Santal.* Belaunja.

456. Athroisma DC.

A viscid, glabrous or pubescent annual; *leaves* alternate, petioled, pinnatifid. *Flower*-heads small, heterogamous, disciform, in globose or ovoid, terminal, peduncled clusters that are sessile on a common cylindric receptacle; outer florets female, very few, inner florets hermaphrodite, very numerous, all fertile; involucre of only 1–2 paleaceous bracts; receptacle cylindric, with broad, dry paleæ, like the involucral bracts but longer, enclosing the flowers. *Calyx*-limb annular. *Petals* of female florets connate in filiform corollas, 2–3-toothed at apex; of hermaphrodite florets 4, connate in regular tubular corollas, with campanulate, shortly 4-lobed limb. *Stamens* syngenesious; anthers with sagittate bases; auricles connate, acute. *Style* of hermaphrodite florets with short, flattened, very obtuse arms. *Cypsela* black, with convex outer and flattened inner face, margin ciliate; pappus a short, stellately spreading, fimbriate corona.

1062. Athroisma laciniatum DC.; F. B. I. iii. 276.

Behar; C. and E. Bengal.

A viscid annual weed.

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457. Gnaphalium Linn.

Hoary or woolly herbs; *leaves* alternate, quite entire. *Flower*-heads small, heterogamous, disciform, in terminal or axillary corymbs or fascicles; outer florets female, 2- or more-seriate, inner fewer, hermaphrodite, all fertile; involucre ovoid or campanulate; bracts many-seriate, all scarious, or with a white, yellow, or brown, more or less scarious lamina; receptacle naked or pitted. *Calyx*-limb setose. *Petals* of female florets connate in filiform corollas, 3–4-toothed at apex; of hermaphrodite florets 5, connate in regular, slender, tubular corollas, with dilated, 5-toothed limb. *Stamens* syngenesious; anthers with sagittate base; cells with slender tails. *Style* of hermaphrodite florets with truncate or capitate arms. *Cypsela* oblong or obovoid, smooth; pappus-hairs 1-seriate, slender or thickened at tip, connate or not at base, caducous.

Heads in leafless, corymbose clusters:—
  Stems usually many from the root; heads golden-yellow *luteo-album* var. *multiceps*.
  Stems corymbosely branched above; heads pale brown *luteo-album* var. *pallidum*.
Heads leafy:—
  Heads arranged in simple or branched leafy spikes..............*indicum*.
  Heads in rounded axillary or terminal leafy clusters:—
    Densely woolly; leaves small, spathulate; bracts of the involucre lanceolate, green with straw-coloured tips..................*pulvinatum*.
    Sparingly cottony; leaves obovate-spathulate, rather large, flaccid; bracts of involucre broadly oblong, with glistening white or rose-coloured tips..*flaccidum*.

1063. GNAPHALIUM LUTEO-ALBUM Linn. var. MULTICEPS F. B. I. iii. 288; E. D. G. 302. *G. orixense* F. I. iii. 425.
Chota Nagpur; Orissa.
An annual weed.

1063/2. Var. PALLIDUM F. B. I. iii. 288; E. D. G. 302. *G. alboluteum* F. I. iii. 425.
In most of the provinces.
An annual weed.

1064. GNAPHALIUM INDICUM Linn.; F. B. I. iii. 289. *G. strictum* F. I. iii. 424. *G. multicaule* F. I. iii. 425.
In all the provinces.
A slender cottony weed.

1065. Gnaphalium pulvinatum DC.; F. B. I. iii. 289. *G. depressum* F. I. iii. 425.

In the western and northern provinces.

A decumbent cottony weed.

1066. Gnaphalium flaccidum Kurz; F. B. I. iii. 290.

N. Bengal.

A flaccid, green, annual weed.

458. **Cæsulia** Roxb.

A glabrous marsh-herb; *leaves* alternate, serrulate. *Flower*-heads in sessile, axillary, involucrate balls, each sessile on a broad, convex common receptacle, and each 1-flowered; involucral bracts 2, opposite, keeled or winged, ultimately adnate to and enclosing the cypsela. *Calyx*-limb obsolete. *Petals* 5, connate in a tubular corolla, with deeply cleft, campanulate limb. *Stamens* syngenesious; anthers with sagittate base; tails branched. *Style* with short, linear-cuneate, subtruncate arms. *Cypsela* included in the laterally compressed bracts; pappus 0.

1067. Cæsulia axillaris Roxb.; F. I. iii. 448; F. B. I. iii. 291.

In all the provinces.

A glabrous marsh herb.

459. **Vicoa** Cass.

Annual or perennial, glabrous or hairy herbs; *leaves* alternate, entire or toothed, upper stem-clasping. *Flower*-heads heterogamous and rayed, or from absence of ray homogamous and disciform, terminal solitary or on leaf-opposed peduncles, woolly; outer ray-florets when present 1–2-seriate, female, disk-florets numerous, hermaphrodite, all fertile; involucre campanulate; bracts many-seriate, narrow, inner scarious, outer shorter, herbaceous with scarious margin; receptacle flat or subconvex, naked. *Calyx*-limb setose. *Petals* of ray-florets connate, narrowly ligulate, 2–3-toothed; of hermaphrodite florets 5, connate in regular, tubular, slender corollas, with hardly dilated, 5-toothed limb. *Stamens* syngenesious; anthers with sagittate base; tails slender. *Style* of hermaphrodite florets with flattened arms, broader upwards, obtuse or truncate. *Cypsela* small, hardly ribbed, tip rounded; pappus-hairs 5–many, 1-seriate, smooth or scabrid, sometimes mixed with small, chaffy scales.

Leaves lanceolate or oblong-lanceolate, acuminate, entire or serrulate, often scabrid above; bracts of the involucre hardly recurved; a slender, rigid annual, pubescent and viscid or glabrate.....................*auriculata.*

Leaves oblong or linear-oblong, obtuse or subacute, serrate, softly hairy; bracts of the involucre squarrose, their tips filiform, recurved; a short, rather stout, woolly, or softly hairy herb ....*vestita.*

1068. VICOA AURICULATA Cass.; F. B. I. iii. 297. *Doronicum calcaratum* F. I. iii. 434.
Tirhut; Behar; Chota Nagpur.
A slender, rigid, usually branching, leafy annual.

1069. VICOA VESTITA Benth.; F. B. I. iii. 297.
Tirhut; Behar; N. Bengal.
A softly woolly or hairy herb.

460. **Pulicaria** Gaertn.

Annual or perennial, usually woolly or villous herbs; *leaves* alternate, sessile, often stem-clasping. *Flower*-heads heterogamous and rayed, or from absence of ray homogamous and disciform, solitary; ray-florets female, 1–2-seriate; disk-florets numerous, hermaphrodite, all fertile; involucre hemispheric or obconic; bracts few-seriate, narrow, acuminate or awned; receptacle flat or subconvex, pitted. *Calyx*-limb irregularly annular. *Petals* of ray-florets connate, narrowly ligulate, or in a minutely 2–3-toothed, oblique, short tube, or 0; of hermaphrodite florets 5, connate in regular, slender, tubular corollas, with narrowly elongated, shortly 5-fid limb. *Stamens* syngenesious; anthers with sagittate base; tails very slender, simple or branched. *Style* of hermaphrodite florets with linear, slightly flattened, obtuse arms. *Cypsela* terete or ribbed; pappus double, outer of short, jagged teeth, inner of smooth, scabrid or bearded, filiform or flattened hairs.

Bracts of the involucre almost setaceous; leaves with a wide or contracted half-stem-clasping base; ray-florets tubular; achenes hairy *foliolosa.*

Bracts of the involucre herbaceous, lanceolate; leaves with a narrow base; ray-florets usually ligulate; achenes glabrate ....*angustifolia.*

1070. PULICARIA FOLIOLOSA DC.; F. B. I. iii. 298; E. D. P. 1408.
Tirhut; Behar; N. Bengal.
A much-branched pubescent annual.

1071. Pulicaria angustifolia DC.; F. B. I. iii. 299.
Chota Nagpur.
A softly pubescent annual.

461. Emilia Cass.

Annual or perennial herbs, often glaucous, glabrous or hairy; radical *leaves* crowded, petioled, entire, toothed or lyrate-pinnatifid; cauline few, stem-clasping. *Flower*-heads homogamous, disciform, yellow or red, long-peduncled, solitary or laxly corymbose, not bracteate at base; florets all hermaphrodite, fertile; involucre cylindric; bracts 1-seriate, equal, free or connate, striate; receptacle flat, naked. *Calyx*-limb setose. *Petals* connate in tubular corollas, with long, cylindric limb, slightly 5-fid at the apex. *Stamens* syngenesious; anthers with subobtuse, entire bases. *Style* with subterete arms, tips short obtuse, or long acute. *Cypsela* subterete, or angled and 5-ribbed; pappus-hairs copious, white, soft, slender.

1072. Emilia sonchifolia DC.; F. B. I. iii. 336. *Cacalia sonchifolia* F. I. iii. 413.
In all the provinces.
A glabrous weed. *Beng.* Sadi-modi.

462. Senecio Linn.

Herbs, undershrubs or shrubs; *leaves* radical or alternate, entire or variously divided. *Flower*-heads heterogamous, usually yellow, solitary, corymbose or racemose; outer florets rayed, female, rarely 0; disk-florets hermaphrodite, all fertile; involucre various; bracts 1-seriate or sub-2-seriate, equal, erect, free or connate at base, with few or many, very short outer ones; receptacle flat or convex, naked, pitted, or fimbrillate. *Calyx*-limb setose. *Petals* of ray-florets connate in ligulate corollas, the blade large or small; of hermaphrodite florets connate in regular tubular corollas, with a narrow, shortly 5-toothed, or a campanulate, 5-cleft limb. *Stamens* syngenesious; anthers obtuse or auricled or minutely tailed at base. *Style* of hermaphrodite florets with recurved arms, tips truncate and penicillate, rarely rounded, or with a short, narrow point. *Cypsela* subterete, or those of outer florets dorsally compressed, 5–10-ribbed; pappus-hairs copious or sparse, soft, white, smooth, scabrid or bearded.

Disk-florets with a campanulate limb; leaves irregularly crenulate, lobulate or toothed; bracts of the involucre oblong, acute; achenes puberulous ....*nudicaulis*.
Disk-florets with a slender tubular limb; leaves pinnatifid; bracts of the involucre linear-lanceolate; achenes scabrid ....*tetrandrus*.

1073. SENECIO NUDICAULIS Ham.; F. B. I. iii. 340.
Chota Nagpur; N. Bengal, Duars.
A slender or stout, usually scapigerous herb, 6 in. to 3 feet high.

1074. SENECIO TETRANDRUS Ham.; F. B. I. iii. 342.
N. Bengal, Duars.
A weak, straggling weed, 4 to 8 in. high.

463. **Flaveria** Juss.

Glabrous or minutely pubescent herbs; *leaves* opposite, entire or toothed, narrow. *Flower*-heads heterogamous, with one female and few hermaphrodite florets, or homogamous with few hermaphrodite florets, or occasionally with a solitary female or hermaphrodite floret, all fertile: narrow, sessile, secund in dense cymes or fascicled, floral leaves sometimes involucrate; involucre of 2–4 elongated, subequal bracts, with occasionally 1–2 small outer; receptacle small, naked. *Calyx*-limb obsolete. *Petals* of female florets connate in ligulate corollas, with small, entire blade, hardly as long as their styles; of hermaphrodite connate in regular tubular corollas, with turbinate-campanulate, 5-fid limb. *Stamens* syngenesious; anthers with entire, obtuse bases. *Style* of hermaphrodite florets with truncate arms. *Cypsela* oblong, with 8–10 raised ribs; pappus 0.

1075. FLAVERIA REPANDA Lagasc.
W. Behar, rare.
An introduced weed; slowly spreading eastward from the Deccan, where it is now common.

464. **Tagetes** Linn.

Herbs erect or diffuse, glabrous, with often oil-glands in bracts and leaves; *leaves* opposite, pinnately divided, rarely subentire, serrulate. *Flower*-heads heterogamous, rayed; ray-florets 1-seriate, female; disk-florets hermaphrodite, fertile; sometimes only a solitary ray-floret, rarely ray-florets quite absent and heads homogamous, florets all fertile: small or large, long-peduncled or

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corymbose; involucre cylindric; bracts 1-seriate, equal, connate to middle or beyond, occasionally with a solitary outer bract; receptacle flat, naked or pitted, fimbrillate. *Calyx*-limb paleaceous. *Petals* of ray-florets connate in a ligulate corolla, with flat, spreading, entire or 2-lobed lamina; of hermaphrodite connate in regular tubular corollas, with a usually enlarged, 5-fid limb. *Stamens* syngenesious; anthers with obtuse, entire bases. *Style* of hermaphrodite florets with slender, truncate, and penicillate or shortly appendaged arms. *Cypsela* linear, narrowed at base, compressed or angular, hardly striate, with conspicuous, basilar callus; pappus of few, usually 5–6, aristate or truncate scales.

1076. TAGETES PATULA Linn.; E. D. T. 17.

In all the provinces; cultivated, but often also as an escape.

A showy-flowered annual. *Beng.* and *Hind.* Genda; *Uriya* Gendu.

465. **Xanthium** Linn.

Annual coarse herbs, unarmed or with 3-fid spines; *leaves* alternate, toothed or lobed. *Flower*-heads monœcious, female 2-flowered, fertile, and hermaphrodite, globose, many-flowered, sterile, the latter in the upper axils; involucre of hermaphrodite head short; bracts few, 1–2-seriate, narrow; receptacle cylindric with hyaline pales enclosing the flowers; involucre of female head with the bracts connate as an ovoid, 2-beaked, herbaceous utricle with 2 1-fld. cells, clothed with hooked bristles, and sometimes with a few small, free, outer bracts. *Calyx*-limb obsolete. *Petals* of female florets 0; of hermaphrodite florets 5, connate in a tubular corolla, with inflated, 5-toothed limb. *Stamens* of hermaphrodite florets with monadelphous filaments and free anthers, bases of anthers obtuse, apices inflexed, mucronate. *Style* of hermaphrodite florets slender, simple; of female with free arms exserted from involucre. *Cypsela* enclosed in the hardened involucral cell, obovoid, thick; pappus 0.

Stems unarmed .... *strumarium.*
Stems armed with numerous 3-fid spines .... *spinosum.*

1077. XANTHIUM STRUMARIUM Linn.; F. B. I. iii. 303; E. D. X. 1. *X. indicum* F. I. iii. 601.

In all the provinces.

A coarse, unarmed annual, with bur-like heads. *Vernac.* Chhota-gokhru, ban-okra.

1078. Xanthium spinosum Linn.

C. Bengal; occasional in waste places.

A rather rigid, much-branched, spiny annual, with bur-like heads. A native of Southern Europe, recently introduced.

466. **Lagascea** Cav.

Rigid, villous, scabrid or subglabrous herbs; *leaves* opposite or the upper alternate. *Flower*-heads in leafy balls, which are solitary, terminal, and peduncled, or in corymbose panicles, each 1-flowered; florets hermaphrodite, fertile; involucre tubular, of 5 connate bracts; receptacle minute. *Calyx*-limb irregularly annular. *Petals* 5, connate in a shortly tubular corolla, with elongated, cylindric or dilated, 5-fid limb. *Stamens* syngenesious; anthers with sagittate, obtusely auricled bases. *Style* with elongated, acute, hairy arms. *Cypsela* cuneate, compressed or trigonous, tip rounded; pappus a toothed or fimbriate cup or ring, with sometimes bristles at the angles of the achene.

1079. Lagascea mollis Cav.; F. B. I. iii. 302.

C. Bengal.

An introduced weed of cultivated places.

467. **Zinnia** Linn.

Annual or perennial herbs or undershrubs; *leaves* opposite, quite entire. *Flower*-heads heterogamous, rayed; ray-florets female, 1-seriate; disk-florets numerous, hermaphrodite, all fertile; heads large or medium, peduncled at ends of branches or in cymes, usually thickened near top; involucre campanulate or subcylindric; bracts 3- or more-seriate, imbricate, obtuse, wide, dry, becoming gradually shorter from within outwards; receptacle conic or ultimately cylindric, paleaceous. *Calyx*-limb aristate. *Petals* of female ray-florets connate in a spreading, entire ligule, sessile or shortly tubular below; of hermaphrodite 5, connate in regular tubular corollas, with a slightly enlarged, cylindric, shortly 5-lobed limb. *Stamens* syngenesious; anthers entire at base. *Style* with elongated, obtuse or subtruncate arms, hardly appendaged. *Cypsela* narrow, striate, compressed or 3-quetrous, truncate or with the angles produced into 1–3 aristate teeth.

1080. Zinnia pauciflora Linn.

In gardens in every province, but occasionally also springing up subspontaneously.

A rigid annual. *Zinnia elegans*, another species common in gardens, does not show the same tendency to come up spontaneously.

468. Siegesbeckia Linn.

Herbs, glandular-pubescent; *leaves* opposite, toothed. *Flower*-heads heterogamous, subradiate, yellow or white; ray-florets female, 1-seriate, fertile; disk-florets hermaphrodite, fertile or the inner sterile: in leafy panicles; involucre campanulate or hemispheric; bracts few, herbaceous, glandular, outer usually 5, spathulate, spreading, inner enclosing the ray-florets; receptacle small, with membranous, concave pales. *Calyx*-limb obsolete. *Petals* of ray-florets connate in short-tubed corollas, with 2–3-fid limb or a short, broad ligule; of hermaphrodite florets connate in regular tubular corollas, with campanulate 5-fid, or narrow 3–4-toothed limb. *Stamens* syngenesious; anthers with entire bases. *Style* of hermaphrodite florets with short, flattened, subacute arms. *Cypsela* obovoid-oblong, often incurved; apex obtuse; pappus 0.

1081. Siegesbeckia orientalis Linn.; F. I. iii. 439; F. B. I. iii. 304. *S. brachiata* F. I. iii. 439.

Chota Nagpur.

A glandular-pubescent herb.

469. Enhydra Lour.

Glabrous or scaberulous marsh-herbs; *leaves* opposite, sessile. *Flower*-heads axillary, subsessile, or in alternate axils, heterogamous, subradiate; ray-florets female, many-seriate, fertile; disk-florets hermaphrodite, fertile, or inner sterile; involucre of 4 foliaceous bracts in opposite pairs, the two outer larger; receptacle convex or conic; pales enclosing the flowers, tipped with glandular hairs. *Calyx*-limb obsolete. *Petals* of ray-florets connate in corollas, shorter than their styles, with short, broad, 3–4-tooth ligula; of hermaphrodite florets connate in regular tubular corollas, with a campanulate 5-fid limb. *Stamens* syngenesious; anthers with obtuse, entire base. *Style* of hermaphrodite florets with obtuse arms hispid at the tips. *Cypsela* oblong, enclosed in the rigid pales, outer dorsally, inner sometimes laterally compressed; pappus 0.

1082. Enhydra fluctuans Lour.; F. B. I. iii. 304; E. D. e. 213.
Hingtsha repens F. I. iii. 448.
C. and E. Bengal.
A glabrous marsh-herb. *Hind.* Harhúch; *Beng.* Hingcha.

470. **Eclipta** Linn.

Annual herbs, strigose or hirsute; *leaves* opposite. *Flower*-heads small, axillary or terminal, peduncled, heterogamous, rayed; ray-florets female, sub-2-seriate, fertile or sterile; disk-florets hermaphrodite, fertile; involucre wide-campanulate; bracts sub-2-seriate, herbaceous, the outer larger and broader; receptacle flat or slightly convex; pales enclosing several flowers, inner narrow or 0. *Calyx*-limb truncate or aristate. *Petals* of ray-florets connate in a short corolla, with small, entire, or 2-toothed ligule; of hermaphrodite florets connate in regular tubular corollas, with shortly 4–5-lobed limb. *Stamens* syngenesious; anthers with obtuse, subentire bases. *Style* with flattened arms with short or triangular obtuse appendages. *Cypsela* of ray-florets triquetrous, often empty; of disk stouter, laterally subcompressed; apex entire, toothed or 2-aristate.

1083. Eclipta alba Hassk.; F. B. I. iii. 304; E. D. e. 7.
E. prostrata F. I. iii. 438.
In all the provinces.
A slender, diffuse or suberect weed. *Hind.* Moch-kand, bhangra, babri; *Beng.* Kesari, kesuti; *Uriya* Kesarda; *Santal.* Lal kesari.

471. **Blainvillea** Cass.

Scabrid or villous herbs; *leaves* opposite or the upper alternate, petioled, toothed. *Flower*-heads small, subsessile or peduncled, terminal or axillary, heterogamous, rayed or subdisciform; outer florets female, 1–2-seriate; disk-florets hermaphrodite, all fertile; involucre broadly ovoid or subglobose; bracts few, outer herbaceous, inner gradually passing into the rigid, membranous, concave or involute scales of the small convex receptacle. *Calyx*-limb setose. *Petals* of female florets connate in small, 2–3-toothed ligules, or ligules obsolete; of hermaphrodite florets connate in regular tubular corollas, with dilated, 5-fid limb. *Stamens* syngenesious; anthers with entire obtuse bases. *Style* of hermaphrodite florets with narrow, flattened arms, with acute or subobtuse appendages. *Cypsela* truncate, of ray-florets 3-quetrous or dorsally compressed, of disk-florets 3-4-angled or laterally compressed; pappus of 2–5 unequal bristles connate at the base.

1084. BLAINVILLEA LATIFOLIA DC.; F. B. I. iii. 305. *Verbesina Lavenia* F. I. iii. 442.

Chota Nagpur.

A rigid, hispid weed, 1–2 feet high.

472. **Wedelia** Jacq.

Scabrid, pubescent, or hirsute herbs or shrubs, sometimes scandent; *leaves* opposite. *Flower*-heads axillary or terminal, heterogamous, rayed; ray-florets female, fertile; disk-florets hermaphrodite, fertile, or the inner sterile; involucre campanulate or subhemispheric; bracts sub-2-seriate, outer 3–5 usually herbaceous, the inner dry; receptacle flat or convex; pales enclosing the flowers. *Calyx*-limb obsolete or annular. *Petals* of ray-florets connate in a corolla, with spreading, entire, or 2-toothed ligule; of hermaphrodite florets connate in regular tubular corollas, with elongated, 5-toothed limb. *Stamens* syngenesious; anthers with entire or subsagittate base. *Style* of hermaphrodite florets with acute arms, hirsute at their tips. *Cypsela* cuneate-oblong or obovoid, thick, smooth or tubercled, laterally compressed or the outer triquetrous, tip rounded, margins obtuse or thickened; pappus 0, or a toothed cup or ring, or sometimes of short scales with occasionally a few bristles.

Achenes truncate at the tip:—
  Leaves not 3-nerved; inner bracts of the involucre narrowed and distinctly pointed; a prostrate herb.................................*calendulacea.*
  Leaves 3-nerved; inner bracts of the involucre subobtuse; a large littoral climber ....*scandens.*
Achenes contracted at the tip; leaves 3-nerved; inner bracts of the involucre subulate; a suberect herb...............................*Wallichii.*

1085. WEDELIA CALENDULACEA Less.; F. B. I. iii. 306; E. D. W. 25. *Verbesina calendulacea* F. I. iii. 440.

C. and E. Bengal.

A procumbent herb, growing in wet places. *Hind.* Bhangra; *Beng.* Kesaraj, bhimraj.

1086. Wedelia scandens Clarke. *W. biflora* F. B. I. iii. 306. *Verbesina scandens* F. I. iii. 441.
Sundribuns.
A large shrubby climber, near the sea-coast.

1087. Wedelia Wallichii Less.; F. B. I. iii. 307. *Verbesina biflora* F. I. iii. 440.
Chota Nagpur.; N. Bengal, Duars.
A weed of grassy places.

473. Tithonia Desf.

Large robust herbs, with shrubby, perennial base; *leaves* alternate, petioled, entire or 3-lobed. *Flower*-heads large, showy, on long, thickened peduncles, heterogamous, rayed; ray-florets neuter; disk-florets hermaphrodite, fertile; involucre hemispheric or wide-campanulate; bracts 2-seriate, slightly unequal, rigid and striate, close-set below, wider and leafy above; receptacle convex; pales folded, striate, aristate, embracing the hermaphrodite flowers. *Calyx*-limb aristate. *Petals* of ray-florets connate in large, spreading, entire or somewhat 2-toothed, yellow ligules; of disk-florets connate in regular tubular corollas; tube slightly contracted above the base, villous; limb elongated, cylindric, 5-toothed. *Stamens* syngenesious; anthers with entire base. *Style* of hermaphrodite florets with arms ending in linear-lanceolate, puberulous appendages. *Cypsela* oblong, compressed, tetragonous; pappus of 2 aristæ, deciduous or persistent, with numerous intervening, persistent scales.

1088. Tithonia tagetiflora Desf.
In most of the provinces, cultivated.
A large, shrubby "Sunflower," the leaves smelling of camphor; very rarely propagating itself spontaneously by seeds, but readily doing so by its rootstocks.

474. Helianthus Linn.

Annual or perennial herbs, often tall; *leaves* opposite or the upper or all alternate, entire or toothed. *Flower*-heads large or very large, peduncled, solitary or loosely corymbose, heterogamous, rayed; ray-florets 1-seriate, neuter; disk-florets hermaphrodite, fertile, sometimes from absence of ray homogamous; involucre wide-campanulate; bracts 2–many-seriate, membranous or herbaceous, obtuse or acute; receptacle flat or convex; pales infolded, enclosing the hermaphrodite flowers. *Calyx*-limb aristate. *Petals* of ray-florets connate in large, spreading, ligulate corollas, with long, entire lamina; of hermaphrodite florets connate in regular tubular corollas, with elongated, enlarged, shortly 5-fid limb. *Stamens* syngenesious; anthers entire or minutely 2-lobed at base. *Style* of hermaphrodite florets with arms ending in short or long pubescent appendages. *Cypsela* oblong or nearly obovate, thick, compressed, or slightly 4-angled; pappus of 2 aristæ, often dilated, paleaceous below, caducous, sometimes with 1–2 smaller, intermediate, caducous bristles.

Roots not tuberous; annual herbs:—
  Leaves and stems scabridly hairy .... *annuus.*
  Leaves and stems softly cottony .... *argyrophyllus.*
Roots tuberous; perennial herbs .... *tuberosus.*

1089. HELIANTHUS ANNUUS Linn.; E. D. H. 74.
In gardens in all the provinces; cultivated only.
A tall annual, occasionally cultivated also as an oil-seed crop. *Vernac.* Surajmukhi. The common Sunflower.

1090. HELIANTHUS ARGYROPHYLLUS Torr. & Gr.
In gardens in all the provinces; cultivated and also freely springing up spontaneously in cultivated ground and waste places.
A tall annual with softly cottony leaves. *Vernac.* Safed surajmukhi. The "Rains" Sunflower.

1091. HELIANTHUS TUBEROSUS Linn.; E. D. H. 88.
In gardens generally.
A perennial herb with tuberous, edible roots. *Beng.* Brahmokha. The Girasole, or Jerusalem Artichoke.

475. Spilanthes Linn.

Annual herbs; *leaves* opposite. *Flower*-heads usually long-peduncled, axillary or terminal, heterogamous and rayed, or homogamous and disciform; ray-florets, when present, female, 1-seriate; disk-florets hermaphrodite, all fertile; involucre ovoid or campanulate; bracts sub-2-seriate; receptacle convex, elongate; pales enclosing the florets, often connate with the ovary as a stalk. *Calyx*-limb obsolete. *Petals* of ray-florets connate in a white or yellow ligulate corolla; of hermaphrodite florets regular, tubular, with a 4–5-fid limb. *Stamens* syngenesious; anthers with truncate, entire, or 2-toothed base. *Style* of hermaphrodite florets with truncate arms. *Cypsela* of ray trigonous or dorsally compressed, margins and angles usually ciliate; pappus 0, or of 2–3 bristles.

1092. Spilanthes Acmella Linn.; F. B. I. iii. 307; E. D. S. 2571.

Chota Nagpur; N. Bengal; Chittagong.

An erect annual herb. *Beng.* Marhata-tiga.

476. **Guizotia** Cass.

Annual herbs; *leaves* opposite or the upper alternate. *Flower*-heads peduncled, axillary and terminal, heterogamous, rayed; ray-florets 1-seriate, female; disk-florets hermaphrodite, all fertile; involucre campanulate; bracts sub-2-seriate; outer subfoliaceous, inner passing into pales; receptacle convex or conic; pales flat, scarious. *Calyx*-limb obsolete. *Petals* of ray-florets connate in yellow, ligulate corollas, with 2–3-toothed lamina; of hermaphrodite florets connate in regular tubular corollas, with campanulate, 5-fid limb; corolla-tube of both kinds short, woolly, embracing the top of the cypsela. *Stamens* syngenesious; anthers with entire, truncate base. *Style* of hermaphrodite florets with arms ending in subulate, hairy tips. *Cypsela* glabrous, dorsally compressed; apex rounded; pappus 0.

1093. Guizotia abyssinica Cass.; F. B. I. iii. 308; E. D. G. 735. *Verbesina sativa* F. I. iii. 441.

Cultivated in all the western and northern provinces.

A stout, erect, annual oil-seed crop of the cold season. *Vernac.* Surgúja, ram-tila.

477. **Synedrella** Gaertn.

Annual, branched, pubescent or villous herbs; *leaves* opposite, petioled, toothed. *Flower*-heads small, axillary and terminal, heterogamous, rayed; ray-florets 1–2-seriate, female; disk-florets hermaphrodite, all fertile; involucre ovoid or oblong; bracts few, the outer 1 or 2 foliaceous, the others passing into pales; receptacle small; pales flat, scarious. *Calyx*-limb 2–3-toothed. *Petals* of ray-florets connate in ligulate corollas, with short, broad, 2–3-toothed, yellow lamina; of hermaphrodite florets connate in regular tubular corollas, with 4-toothed limb. *Stamens* syngenesious; anthers with subentire bases. *Style* of hermaphrodite florets with arms ending in long, acute tips. *Cypsela* of ray-florets dorsally compressed, smooth, with 2 lacerate wings; of central florets few, narrower, compressed or trigonous, often muricate; pappus in both represented by spines at the top of the angles.

1094. SYNEDRELLA NODIFLORA Gaertn.; F. B. I. iii. 308.

C. Bengal; in cultivated ground.

An erect, branching, annual herb.

478. **Glossocardia** Cass.

A branched annual, glabrous herb; *leaves* alternate, slender, 1–2-pinnatisect. *Flower*-heads small, terminal and axillary, heterogamous, rayed; ray-florets female, usually solitary; disk-florets hermaphrodite, few, all fertile; involucre oblong; bracts few, outer 1–3 slender, herbaceous, inner oblong, with broad, membranous margins; receptacle flat, small; pales few, flat. *Calyx*-limb 2-toothed. *Petals* of ray-florets connate in ligulate corollas, with 2-fid lamina; of hermaphrodite florets connate in regular tubular corollas, with 4-fid limb. *Stamens* syngenesious; anthers with obtuse, entire base. *Style* of hermaphrodite florets with arms ending in linear, acute, hispid tips. *Cypsela* narrowly oblong, dorsally much compressed; faces bearded; pappus of 2 smooth, stiff awns.

1095. GLOSSOCARDIA LINEARIFOLIA Cass.; F. B. I. iii. 308; E. D. G. 247. *Verbesina Boswellia* F. I. iii. 443.

W. Behar; Chota Nagpur.

A prostrate or, rarely, erect, diffusely branched, glabrous annual. *Hind.* Seri.

479. **Cosmos** Cav.

Annual or perennial, often tall herbs; *leaves* opposite, entire, lobed or 2–3-pinnatisect. *Flower*-heads large or medium, long-stalked, solitary or loosely corymbose, heterogamous, rayed; ray-florets 1-seriate, neuter; disk-florets hermaphrodite, fertile, occasionally homogamous from abortion of ray; involucre subhemispheric; bracts 2-seriate, connate below, membranous, striate, somewhat unequal or the outer smaller, sometimes narrow, subherbaceous; receptacle flat; pales flat or concave. *Calyx*-limb 2–4-toothed. *Petals* of ray-florets connate in ligulate corollas, with a spreading, entire, or somewhat toothed lamina;

of hermaphrodite florets connate in regular tubular corollas, with a cylindric, shortly 5-fid limb. *Stamens* syngenesious; anthers with entire or minutely 2-toothed base. *Style* of hermaphrodite florets with slender arms thickened upwards, hirsute, with short, acute appendages. *Cypsela* narrow, somewhat 5-gonous or dorsally compressed, more or less beaked; pappus of 2–4 persistent, retrorsely barbellate awns.

1096. COSMOS SULFUREUS Cav.

Chota Nagpur; C. Bengal.

A weed in waste places; native of America.

480. **Bidens** Linn.

Annual or perennial, sometimes scandent herbs; *leaves* opposite, entire, lobed or 1–2-pinnatisect. *Flower*-heads small corymbose, or medium subsolitary, heterogamous, rayed; ray-florets 1-seriate, neuter, or rarely female, fertile; disk-florets hermaphrodite, fertile, occasionally homogamous from abortion of ray; involucre campanulate or subhemispheric; bracts sub-2-seriate, often slightly connate below, outer short, herbaceous, or long and leafy, inner membranous; receptacle flat or convex; pales narrow, nearly flat. *Calyx*-limb 2–4-toothed. *Petals* of ray-florets connate in ligulate corollas, with a spreading, entire, or somewhat toothed lamina; of hermaphrodite florets connate in regular tubular corollas, with a cylindric, shortly 5-fid limb. *Stamens* syngenesious; anthers with entire or bluntly sagittate base. *Style* of hermaphrodite florets with arms hirsute upwards, with short acute, or long subulate appendages. *Cypsela* dorsally compressed or somewhat 4-gonous, linear or cuneiform, often narrowed but not beaked above; pappus of 2–4 persistent, retrorsely barbellate awns.

1097. BIDENS PILOSA Linn.; F. B. I. iii. 309. *B. bipinnata* F. I. iii. 411.

Chota Nagpur; N. Bengal.

An erect herb, with adhering, barbed achenes.

481. **Glossogyne** Cass.

Perennial glabrous herbs, with almost naked stems and branches; *leaves* radical, crowded, pinnatifid, or cuneate and 3-toothed, cauline alternate or the lower opposite or 0. *Flower*-heads small, few, corymbose, heterogamous and rayed; ray-florets female;

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disk-florets hermaphrodite, all fertile, occasionally homogamous from abortion of ray; involucre small; bracts 2–3-seriate, narrow, bases connate; receptacle flat; pales scarious, concave or flat. *Calyx*-limb 2-toothed. *Petals* of ray-florets connate in ligulate corollas, with spreading, entire, or coarsely 2–3-toothed lamina; of hermaphrodite florets connate in regular tubular corollas, with cylindric, 5-fid limb. *Stamens* syngenesious; anthers with obtuse base. *Style* of hermaphrodite florets with arms ending in long, hairy tips. *Cypsela* dorsally compressed linear-ovoid or faintly winged, glabrous, truncate; pappus of 2 slender, retrorsely barbellate awns.

1098. GLOSSOGYNE PINNATIFIDA DC.; F. B. I. iii. 310; E. D. G. 250. *Zinnia Bidens* F. I. iii. 435.

In all the western and northern provinces.

A perennial glabrous herb. *Santal.* Barangom, bir barangom.

482. Chrysanthellum Rich.

Annual glabrous herbs; *leaves* alternate, pinnatifid, or radical, toothed. *Flower*-heads small, peduncled, terminal and axillary, heterogamous, rayed; ray-florets 1-seriate, female; disk-florets hermaphrodite, all fertile; involucre hemispheric; bracts 1–2-seriate; receptacle flat; pales narrow, flat, scarious. *Calyx*-limb truncate. *Petals* of ray-florets connate in ligulate corollas, with spreading, entire, or 2-toothed lamina; of hermaphrodite florets connate in regular tubular corollas, with campanulate, 5-fid limb. *Stamens* syngenesious; anthers with entire, obtuse bases. *Style* of hermaphrodite florets with slender arms ending in long, subulate tips. *Cypsela* linear-oblong, dorsally compressed, smooth on those of outer florets, or externally tuberculate, the outermost thick with obtuse margins, the inner flattened and 2-winged; pappus a minute corona.

1099. CHRYSANTHELLUM INDICUM DC.; F. B. I. iii. 310.

Chota Nagpur; Behar; W. Bengal.

An annual glabrous herb.

483. Galinsoga Ruiz & Pav.

Annual herbs; *leaves* opposite, entire or toothed. *Flower*-heads small, peduncled, subterminal and axillary, heterogamous, rayed; ray-florets few, female, 1-seriate; disk-florets hermaphrodite, all fertile; involucre hemispheric; bracts few, 1–2-seriate, ovate, obtuse, striate; receptacle conic or elongate; pales slender, serrate. *Calyx*-limb paleaceous or obsolete. *Petals* of ray-florets connate in ligulate corollas, with yellow, spreading, entire or toothed lamina; of disk-florets in regular tubular corollas, with narrowly campanulate, minutely 5-toothed limb. *Stamens* syngenesious; anthers with subentire base. *Style* of hermaphrodite florets with acute arms, or arms slender with an acute, short tip. *Cypsela* angled, or the outer dorsally compressed; pappus of a few scarious, entire awned or fimbriate scales, of the ray often 0.

1100. GALINSOGA PARVIFLORA Cav.; F. B. I. iii. 311.

C. Bengal, occasionally.

A weak, erect herb, appearing occasionally as a cold-weather weed, but not persisting.

484. **Tridax** Linn.

Perennial herbs; *leaves* opposite, pinnatisect; segments few, narrow. *Flower*-heads very long-peduncled, medium, heterogamous, rayed; ray-florets female; disk-florets hermaphrodite, all fertile; involucre campanulate; bracts few-seriate, outer short, broad, herbaceous; receptacle flat or convex; pales membranous. *Calyx*-limb bristly. *Petals* of ray-florets connate in ligulate or 2-labiate corollas, with a large 3-fid or 3-partite outer, and a smaller 2-fid or 2-partite or obsolete inner lip; of hermaphrodite florets connate in regular tubular corollas, with elongate, 5-fid limb. *Stamens* syngenesious; anthers with short, acute, basal auricles. *Style* of hermaphrodite florets with arms hairy upwards, tips subulate. *Cypsela* turbinate or oblong, silky; pappus of short or long aristate, feathery bristles.

1101. TRIDAX PROCUMBENS Linn.; F. B. I. iii. 311.

In all the provinces.

A weak, straggling, perennial herb.

485. **Chrysanthemum** Linn.

Perennial or annual herbs, rarely shrubs; *leaves* alternate, entire, toothed, lobed or pinnatifid. *Flower*-heads large, terminal, long-peduncled, or smaller and corymbose, heterogamous, rayed, very rarely homogamous from abortion of ray; ray-florets female, 1-seriate; disk-florets hermaphrodite, all fertile; involucre hemispheric or wide-campanulate; bracts many-seriate, broad, adpressed; inner with scarious tips, outer shorter, often with scarious and coloured margins; receptacle flat or convex, naked. *Calyx*-limb cupular, auriculate or obsolete. *Petals* of ray-florets connate in a ligulate corolla, with spreading, entire, or toothed lamina; of hermaphrodite florets connate in regular tubular corollas, with cylindric or 2-winged tube, and more or less campanulate, 4–5-lobed limb. *Stamens* syngenesious; anthers with obtuse, entire base. *Style* of hermaphrodite florets with arms truncate and penicillate at their tips. *Cypsela* subterete or angled, variously ribbed or winged; pappus 0 or short, or cupular or auriculate.

1102. CHRYSANTHEMUM CORONARIUM Linn.; F. B. I. iii. 314; E. D. C. 1043. *Pyrethrum indicum* F. I. iii. 436.

N. Bengal.

An annual herb; a cold-weather field crop. *Hind.* Gul-chini; *Beng.* Gul-dandi.

486. Cotula Linn.

Perennial or annual, often creeping, small herbs; *leaves* alternate, pinnatifid or pinnatisect, rarely entire or toothed. *Flower*-heads small, peduncled, yellow, heterogamous, rarely homogamous, disciform; outer florets female, 1–2-seriate; inner florets hermaphrodite, all fertile or inner sometimes sterile; involucre hemispheric or campanulate; bracts sub-2-seriate, herbaceous or membranous, margins often scarious; receptacle naked. *Calyx*-limb auriculate or obsolete. *Petals* of female florets connate in conic corollas or obsolete; of hermaphrodite florets connate in regular corollas, with thick, 2-winged, or slender, wingless tube; limb shortly 4-fid. *Stamens* syngenesious; anthers with obtuse, entire bases. *Style* of hermaphrodite florets with truncate or obtuse arms, of sterile florets occasionally entire. *Cypsela* of ray-florets or of all florets stipitate, compressed, 2–4-nerved or nerveless, sometimes sheathed above by the base of the corolla, sometimes with a short, auriculate pappus.

Achenes ovate, with thick, narrow wings; leaf-segments not mucronate *anthemoides*.
Achenes angled but not winged; leaf-segments mucronate...*hemisphærica*.

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1103. Cotula anthemoides Linn.; F. B. I. iii. 316; E. D. C. 2025.
Behar, very rare.
A weak, diffuse weed. *Hind.* Babuna.

1104. Cotula hemisphærica Wall.; F. B. I. iii. 316. *Artemisia hemisphærica* F. I. iii. 422.
Tirhut; N. C. and E. Bengal; Chittagong.
An erect weed. *Hind.* Babuna.

487. **Centipeda** Lour.

Annual or perennial herbs; *leaves* alternate, entire or toothed. *Flower*-heads small, sessile on the branches or racemose, disciform, yellow; outer florets female, many-seriate; disk-florets few, hermaphrodite, all fertile; involucre hemispheric; bracts 2-seriate, spreading in fruit; receptacle naked. *Calyx*-limb obsolete. *Petals* of female florets connate in minute, obscurely toothed corollas; of hermaphrodite florets connate in regular, short-tubed corollas, with 4-fid, campanulate limb. *Stamens* syngenesious; anthers with obtuse, entire base. *Style* of hermaphrodite florets with short, truncate arms. *Cypsela* 4-angled, with obtuse tip; angles hairy; pappus 0.

1105. Centipeda orbicularis Lour.; F. B. I. iii. 317; E. D. C. 913. *Artemisia sternutatoria* F. I. iii. 423.
In all the provinces.
A diffuse perennial weed of damp places. *Hind.* Nakhchikni, pachitti; *Beng.* Mechitta.

488. **Sphæromorphæa** DC.

A small perennial herb, pubescent with crisped hairs, with woody rootstock and prostrate, somewhat woody branches; *leaves* alternate, sessile, obovate. *Flower*-heads axillary, subsolitary, shortly peduncled, heterogamous, disciform, yellow; outer florets female, many-seriate; inner fewer, hermaphrodite, all fertile; involucre hemispheric; bracts many-seriate, oblong, obtuse, coriaceous, incurved in fruit; receptacle naked. *Calyx*-limb obsolete. *Petals* of female florets connate in elongated, slender, tubular corollas, inflated below; of hermaphrodite florets connate in regular tubular corollas, with 4-cleft limb. *Stamens* syngenesious, anthers with obtuse, entire bases. *Style* of both female and hermaphrodite florets with 2-fid arms. *Cypsela* subcylindric, slender, broadly ribbed, hairy only at the base; pappus 0.

1106. Sphæromorphæa Russeliana DC.; F. B. I. iii. 317.
W. Bengal; Chota Nagpur; Orissa.
A small, diffuse, straggling weed.

489. **Artemisia** Linn.

Herbs or shrubs, usually strong-scented; *leaves* alternate, entire, serrate or 1–3-pinnatisect. *Flower*-heads small, solitary or fascicled, racemose or panicled, heterogamous or homogamous, disciform; outer florets female, 1-seriate, fertile; disk-florets hermaphrodite, fertile or sterile; involucre ovoid, subglobose or hemispheric; bracts few-seriate, outer shorter, margins scarious; receptacle flat or raised, naked or hirsute. *Calyx*-limb obsolete. *Petals* of outer florets connate in very slender corollas, with 2–3-toothed apex; of hermaphrodite florets regular, tubular, with 5-fid limb. *Stamens* syngenesious; anthers with obtuse, entire base. *Style* of hermaphrodite florets with arms truncate, usually penicillate, when florets sterile the arms often connate. *Cypsela* very minute, ellipsoid, oblong or subobovoid, faintly striate; pappus 0.

Perennial; heads heterogamous; outer florets female, disk-florets hermaphrodite, sterile; leaves flabellately-lobulate ....*parviflora.*
Annual; heads heterogamous; outer florets female, disk-florets hermaphrodite, fertile; leaves capillary-multifid ....*caruifolia.*

1107. Artemisia parviflora Roxb.; F. I. iii. 420; F. B. I. iii. 322; E. D. A. 1458.
Chota Nagpur.
A shrubby, inodorous plant, 1–3 feet high.

1108. Artemisia caruifolia Ham.; F. I. iii. 422 (*caruifolia*); F. B. I. iii. 324.
N. and E. Bengal.
A stout, soft-stemmed plant, 2–4 feet high.

490. **Echinops** Linn.

Thistle-like, white, tomentose herbs; *leaves* alternate, pinnatifid, spinous. *Flower*-heads in globose, involucrate balls, blue or white, sessile or shortly stipitate on a common receptacle, 1-flowered; florets hermaphrodite, fertile; involucre oblong; bracts many-seriate, rigid, pungent or spinescent, outer shorter, inner spathulate, innermost linear or lanceolate, sometimes all connate in a tube, with one long, rigid spine on outer side; receptacle minute. *Calyx*-limb setose. *Petals* connate in a regular tubular corolla, with 5 slender segments. *Stamens* syngenesious; filaments glabrous; anthers with sagittate base; auricles connate; tails short, entire or fimbriate. *Style* with thick arms and with a thick basal ring, at length spreading. *Cypsela* elongate, usually villous; pappus of many short, free or connate bristles.

1109. ECHINOPS ECHINATUS DC.; F. I. iii. 447; F. B. I. iii. 358.
Chota Nagpur; Behar; W. Bengal.
A branched, spreading, rigid annual, 1–2 feet high.

491. Cnicus Linn.

Erect, simple or branching thistles; *leaves* alternate, often decurrent on the stem, serrate or pinnately lobed; lobes or teeth often spinescent. *Flower*-heads solitary, peduncled or subsessile, scattered or crowded, homogamous; florets all hermaphrodite and fertile, or rarely by abortion 1-sexual, diœcious; involucre ovoid, hemispheric or globose; bracts many-seriate, adpressed, erect, spreading, or recurved and spinescent, or with spinescent appendage, the outer subfoliaceous; receptacle flat or convex, densely bristly. *Calyx*-limb hirsute. *Petals* connate in slender tubular corollas, with equal or oblique 5-fid limb. *Stamens* syngenesious; filaments hairy or glabrous; anthers with sagittate base; auricles connate; tails slender. *Style* with short, rarely filiform, obtuse arms. *Cypsela* glabrous, obovoid, obtusely 4-angled, smooth or 5–10-ribbed, truncate or umbonate at the top, with a nearly straight basal areola; pappus-hairs feathery, unequal, with the longer clavellate.

1110. CNICUS ARVENSIS Hoffm.; F. B. I. iii. 362; E. D. C. 1412.
Carduus lanatus F. I. iii. 408.
In all the provinces.
An erect, leafy field-weed. *Beng.* Silkanta.

492. Silybum Gaertn.

An erect, stout, thistle-like herb; *leaves* alternate, white-veined above, sinuately lobed or pinnatifid; lobes and teeth spinescent. *Flower*-heads large, terminal, solitary, nodding, homogamous; florets all hermaphrodite, fertile; involucre wide-campanulate; bracts many-seriate, the outer with wide, spinescent, fimbriate

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base, and with a long, spinescent tip, the inner entire, subspinescent; receptacle flat, densely bristly. *Calyx*-limb annular. *Petals* connate in slender, tubular, regular corollas, with deeply 5-fid, enlarged limb; segments narrow. *Stamens* syngenesious; filaments glabrous, connate in a sheath below; anthers with sagittate base; auricles contiguous, connate, mucronate or shortly tailed. *Style* subentire, annulate, hirsute beyond the faint annulus. *Cypsela* glabrous, obovate-oblong, with straight basal areola; pappus of many-seriate, subpaleaceous, unequal hairs, annulus deciduous with the setæ.

1111. SILYBUM MARIANUM Gaertn.; F. B. I. iii. 364.

In gardens only, in the cold season, in our area.

A large, glabrous thistle, with white-veined leaves.

493. Saussurea DC.

Annual, biennial, or perennial herbs, glabrous or tomentose; *leaves* unarmed, alternate, entire, toothed, pinnatifid or pinnatisect. *Flower*-heads narrow or broad, sometimes crowded on the dilated head of a simple stem, peduncled or sessile, solitary, corymbose, or panicled, homogamous; florets purple or bluish, all hermaphrodite, fertile; involucre ovoid, oblong, globose or hemispheric; bracts many-seriate, adpressed, not spinescent, inner longer, narrower; receptacle flat or convex, densely bristly, rarely naked. *Calyx*-limb annular. *Petals* connate in slender, tubular, regular corollas, with a narrow, 5-fid limb. *Stamens* syngenesious; filaments free, glabrous; anthers with sagittate base; auricles connate; tails usually long, entire, ciliate or woolly. *Style* with linear arms. *Cypsela* glabrous, oblong, 4-ribbed, smooth or rugose; top truncate and cupular, or crowned by a thickened disk and the persistent style-base; basal areola straight; pappus-hairs 1–2-seriate, inner penicillate, base thickened and connate in a deciduous ring; outer of rigid scabrid bristles, rarely penicillate, occasionally 0.

Stem below and inflorescence glabrous; bracts of the involucre glabrate, outer obtuse, inner lanceolate-acuminate; achenes smooth, 10-ribbed *affinis*.

Stem below and inflorescence cottony; bracts of the involucre cottony or pubescent, all lanceolate-acuminate; achenes muricate, 5-angled *candicans*.

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1112. Saussurea affinis Spreng.; F. B. I. iii. 373. *Serratula carthamoides* F. I. iii. 407.

N. and E. Bengal; Chittagong.

An annual herb, 2–8 feet high, stem as thick as the little finger.

1113. Saussurea candicans Clarke; F. B. I. iii. 373; E. D. S. 904.

Chota Nagpur.

An annual herb, 2–5 feet high, stem as thick as the thumb; occasionally small, with scapose, 1-headed stems.

494. Goniocaulon Cass.

An erect, glabrous, branched annual; stem acutely 4–8-angled; *leaves* narrow, alternate, toothed. *Flower*-heads narrow, fascicled and corymbose, homogamous; florets few, all hermaphrodite, fertile; involucre oblong, base very narrow; bracts many-seriate, pale, very narrow, rigid, erect, acute, not spinescent, outer gradually shorter; receptacle very narrow, paleaceous. *Calyx*-limb chaffy. *Petals* connate in regular, similar, slender corollas, with long, cylindric, deeply 5-cleft limb. *Stamens* syngenesious; filaments hirsute; anthers with sagittate base, connate; tails short. *Style* with filiform arms. *Cypsela* glabrous, oblong, subcylindric, about 20-ribbed; basal areola straight; pappus-scales many-seriate, very unequal.

1114. Goniocaulon glabrum Cass.; F. B. I. iii. 377. *Athanasia indica* F. I. iii. 417.

W. Behar.

An erect, glabrous, branched annual, 1–3 feet high.

495. Volutarella Cass.

Annual herbs, dichotomously branched; *leaves* alternate. *Flower*-heads subsolitary, purple, violet, or blue, heterogamous; outer florets 1-seriate, neuter; inner hermaphrodite, fertile; involucre ovoid or globose; bracts many-seriate, innermost narrow, acute, outer shorter, acute, awned or spinescent; receptacle flat, densely bristly. *Calyx*-limb setose. *Petals* connate in regular corollas, with slender, short tube, and cylindric, 5-fid limb. *Stamens* syngenesious; filaments hirsute or glabrous; anthers with sagittate base; auricles connate, shortly tailed. *Style* with filiform, free or connate arms. *Cypsela* obovoid or oblong, angled or almost winged, 5–15-ribbed, often striate and pitted between the ribs; basal areola oblique or lateral; pappus-bristles many-seriate, the outer gradually shorter, innermost 2–4, dilated or flattened.

1115. VOLUTARELLA DIVARICATA Benth.; F. B. I. iii. 383; E. D. v. 279. *Carduus ramosus* F. I. iii. 407.

Behar; Chota Nagpur.

An annual, straggling, stiff weed.

496. Carthamus Linn.

Thistle-like herbs; *leaves* alternate, rigid, spinescent. *Flower*-heads solitary or subcorymbose, rather large, usually homogamous; florets all fertile, hermaphrodite, rarely a few marginal female or neuter; involucre ovoid or subglobose; bracts many-seriate, inner dry, entire, or with a short, fimbriate appendage, outer with a foliaceous, toothed, or spinescent appendage, sometimes absent in cultivated individuals; receptacle flat, densely bristly. *Calyx*-limb obsolete or chaffy. *Petals* connate in regular similar corollas, with slender tube, and oblong, 5-cleft limb, dilated at its base, in female florets petals obsolete. *Stamens* syngenesious; filaments usually hirsute in the middle; anthers with sagittate base, with connate auricles and short, fimbriate tails. *Style* with short or long filiform arms. *Cypsela* glabrous, obovoid, 4-angled or compressed; basal areola oblique or lateral, all or only the outer without a pappus, or all or only the inner with paleaceous, many-seriate pappus.

1116. CARTHAMUS TINCTORIUS Linn.; F. I. iii. 409; F. B. I. iii. 386; E. D. c. 637.

Cultivated in the western and northern provinces.

A thistle-like herb. *Vernac.* Kusumb, kajirah. The Safflower.

497. Cichorium Linn.

Erect, glabrous or hispid herbs, with divaricate, sometimes spinescent branches; *leaves* upper subentire, lower pinnatifid. *Flower*-heads sessile on the branches or on thickened peduncles, homogamous, blue, ligulate; involucre narrow; inner bracts 1-seriate, at length concave at the base with the outer florets in the concavity, outer few, shorter; receptacle flat, naked or somewhat fimbrillate. *Calyx*-limb chaffy. *Petals* connate in narrow, ligulate corollas, lamina truncate, 5-toothed. *Stamens* syngenesious; anthers sagittate at base, with mucronate-acuminate auricles. *Style* with slender, somewhat obtuse arms. *Cypsela* glabrous, somewhat 5-angled, or the outer subcompressed and many-ribbed or striate; base contracted, tip truncate or with the margin slightly produced; pappus of short pales, 2–3-seriate.

1117. Cichorium Intybus Linn. var. Endivia Clarke; F. B. I. iii. 391; E. D. C. 1104.

Cultivated in the western and northern provinces.

An erect herb with divaricate branches. *Beng.* and *Hind.* Kasni. The Endive.

498. **Picris** Linn.

Erect, branched, hispid herbs; *leaves* alternate or radical, entire, toothed, or pinnatifid. *Flower*-heads terminal, long-peduncled, homogamous, yellow, ligulate; involucre suburceolate or campanulate; inner bracts 1-seriate, subequal; outer many-seriate, herbaceous, narrow, or the outermost broad, foliaceous; receptacle flat. *Calyx*-limb hirsute. *Petals* connate in ligulate corollas; lamina truncate, 5-toothed. *Stamens* syngenesious; anthers with sagittate base; auricles acute or shortly setaceous. *Style* with slender arms. *Cypsela* narrow, incurved, subterete, compressed or angled, glabrous, 5–10-ribbed, ribs transversely rugose; beak short or long; all similar or the outer with a shorter beak and pappus obsolete; pappus usually copious, of 1-seriate, soft, penicillate hairs or of fewer rigid hairs, dilated at the base, with sometimes a few outer short hairs.

1118. Picris hieracioides Linn.; F. B. I. iii. 393.

Chittagong, Sitapahar.

A coarse herb, 1–4 feet high.

499. **Crepis** Linn.

Annual or perennial, glabrous or hairy herbs, hairs all simple; *leaves* radical or alternate, cauline often stem-clasping, entire, toothed, or pinnatifid. *Flower*-heads peduncled, solitary, fascicled, or corymbose, yellow or red, homogamous, ligulate; involucre cylindric or campanulate; bracts either many-seriate and regularly imbricate, or the outer smaller and shorter than the linear 1-seriate inner; base or midrib often thickened after flowering; receptacle flat, rarely concave, naked or shortly fimbrillate. *Calyx*-limb hirsute. *Petals* connate in ligulate corollas; lamina truncate, 5-toothed. *Stamens* syngenesious; anthers with sagittate base; auricles acute or shortly setaceous. *Style* with slender arms. *Cypsela* more or less fusiform or oblong, rarely short and cylindric, often slender, glabrous or scaberulous, 10–20-ribbed; tip narrowed or beaked; pappus short or long, usually copious, of simple, soft, usually silvery hairs, rarely brownish and stiff or brittle.

Annual; radical leaves obovate, sinuate-toothed or runcinate-pinnatifid; flowering stems long, slender; heads on slender, bracteolate peduncles; achenes with many subequal ribs ....*japonica*.

Perennial; radical leaves narrowly obovate, spathulate, linear or lanceolate, obtuse or acute, entire or sinuate-toothed; flowering stems usually shorter than the leaves; heads few, on short, bracteolate peduncles; achenes with about 6 thick smooth ribs and slender intermediate ones ....*acaulis*.

1119. CREPIS JAPONICA Benth.; F. B. I. iii. 395.

In all the provinces.

An annual herb, 6–18 in. high.

1120. CREPIS ACAULIS Hook. f.; F. B. I. iii. 396. *Prenanthes acaulis* F. I. iii. 403.

Chota Nagpur; C. Bengal; N. Bengal.

A dwarf perennial herb.

500. **Lactuca** Linn.

Glabrous or hispid, milky herbs; *leaves* radical and alternate, entire, toothed, pinnatifid or pinnate, cauline often stem-clasping and auricled. *Flower*-heads sessile or peduncled, panicled, corymbose, racemose, or subspicate, homogamous, yellow, purple or blue, florets ligulate; involucre usually narrow; bracts few-, rarely many-seriate, thinly herbaceous, margins often membranous, not altering in fruit, inner slender, subequal, outer often very short; receptacle flat, naked. *Calyx*-limb pilose. *Petals* connate in ligulate corollas, with truncate, 5-toothed tip. *Stamens* syngenesious; anthers with sagittate base; auricles acute or setaceous. *Style* with slender arms. *Cypsela* compressed or flattened, ovoid-oblong or narrow, beaked; faces 3–many-ribbed; ribs slender or strong, smooth or rugose, the middle one often strongest; beak slender, or short and cylindric, dilated into an entire or toothed pappose disk; pappus copious, hairs very slender, simple, usually soft and white, very variable, persistent or separately deciduous, sometimes with a minute outer ring.

Stout, succulent, radical leaves many, compact; stem very leafy; achenes black ....*sativa.*
Slender, radical leaves long, membranous, flaccid; stem-leaves few; achenes red-brown ....*polycephala.*

1121. Lactuca sativa Linn.; F. I. iii. 403. *L. Scariola* var. *sativa* F. B. I. iii. 404; E. D. L. 21.

Cultivated in the cold weather in gardens.

A more or less cabbage-like herb. *Vernac.* Káhú, salád. The Garden Lettuce.

1122. Lactuca polycephala Benth.; F. B. I. iii. 410.

N. Bengal.

A slender, flaccid annual weed, with subumbellate inflorescence.

501. Picridium Desf.

Perennial or annual, glabrous milky herbs; *leaves* radical or alternate, toothed or pinnatifid; lobes often crisped, toothed or spinulose. *Flower*-heads long-peduncled, peduncle often hollow, yellow, homogamous, ligulate; involucre campanulate; bracts many-seriate, thinly herbaceous, innermost subequal, lanceolate, unchanged in fruit, outer shorter, broader, with scarious margins; receptacle flat, naked. *Calyx*-limb annular, setose. *Petals* connate in ligulate corollas, with truncate, 5-toothed lamina. *Stamens* syngenesious; anthers with sagittate base; auricles setaceous-acuminate. *Style* with slender arms. *Cypsela* oblong, truncate at both ends, constricted at the tip; ribs 4–5, thick, transversely rugose; pappus-hairs many-seriate, soft, slender, simple, white, connate at the base in a deciduous ring.

1123. Picridium tingitanum Desf.; F. B. I. iii. 413.

Very occasionally in gardens, in the western parts, as an annual only.

A glabrous milky herb.

502. Sonchus Linn.

Annual or perennial milky herbs; *leaves* radical or alternate, cauline often stem-clasping, entire or toothed or pinnatifid; segments often spinulose-toothed. *Flower*-heads terminal, irregularly subcorymbose, umbellate or panicled, yellow, homogamous, ligulate; involucre ovoid, campanulate or cylindric, often dilated, thickened and conic at the base; bracts many-seriate, herbaceous, outer smaller; receptacle flat, naked. *Calyx*-limb setose. *Petals* connate in ligulate corollas, with truncate, 5-toothed lamina. *Stamens* syngenesious; anthers with sagittate base; auricles shortly setaceous, acuminate. *Style* with slender arms. *Cypsela* ovoid, obovoid or ellipsoid, compressed, not beaked, ribbed; ribs smooth or transversely rugose; pappus copious, hairs many-seriate, very slender, simple, usually white and united at the base in a deciduous ring.

Annual; achenes distinctly compressed; heads crowded:—
  Leaves with rounded auricles; achenes faintly muriculate between the 3 ribs of each face .... *asper*.
  Leaves with acute or acuminate auricles; achenes distinctly muricate between the 3 ribs of each face .... *oleraceus*.
Perennial; achenes hardly compressed, with thick, regular ribs; heads lax; leaves with rounded auricles .... *arvensis*.

1124. SONCHUS ASPER Vill.; F. B. I. iii. 414.
In most of the provinces, rather common.
A tall milky annual.

1125. SONCHUS OLERACEUS Linn.; F. B. I. iii. 414; E. D. S. 2357.
In most of the provinces, not very common.
A tall milky annual. *Hind.* Titlia.

1126. SONCHUS ARVENSIS Linn.; F. B. I. iii. 414; E. D. S. 2354. *S. orixensis* F. I. iii. 402.
C. Bengal, rather rare.
A tall, milky-juiced herb, with creeping perennial rootstock. *Hind.* Sahadevi bari; *Beng.* Ban-palang; *Santal.* Bir barangom.

503. **Launea** Cass.

Perennial glabrous herbs, with yellowish juice; *leaves* chiefly radical, sinuate, lobed or pinnatifid, margins often spinulose-toothed. *Flower*-heads peduncled or lateral and sessile on the branches, racemose or paniculate, or solitary or fascicled, yellow, homogamous, ligulate; involucre campanulate or cylindric; bracts many-seriate, herbaceous, margins often membranous, inner sub-equal, outer various; keel often thickened in fruit; receptacle flat, naked. *Calyx*-limb setose. *Petals* connate in ligulate corollas, with truncate, 5-toothed lamina. *Stamens* syngenesious; anthers with sagittate base; auricles acute or shortly setaceous. *Style*-arms slender. *Cypsela* narrow, subterete, or angled or slightly flattened, rarely winged, truncate at both ends or rarely emarginate; ribs 4–5, very stout, close-set, smooth, papillose or narrowly winged or 2-grooved, truncate at each end; pappus copious, hairs many-seriate, simple, very slender, white, a few inner sometimes larger and stronger, all connate at the base into a deciduous ring.

Heads terminal, or racemose on the paniculately branched flowering stem:—
  Margins of the leaves with few or no teeth; teeth, if present, not cartilaginous at the tips..*aspleniifolia*.
  Margins of the leaves closely, sharply toothed, the teeth white, firm, and cartilaginous at the tips..*nudicaulis*.
Heads solitary or fascicled at the nodes of the flagelliform, rooting, flowering stem ....*pinnatifida*.

1127. LAUNEA ASPLENIIFOLIA Hook. f.; F. B. I. iii. 415; E. D. L. 110. *Prenanthes aspleniifolia* F. I. iii. 404 partly.
In all the provinces.
A perennial weed with a slender, vertical, very long rootstock. *Beng.* Tik-chana; *Santal.* Birmalla; *Hind.* Titlia (*Tirhut*).

1128. LAUNEA NUDICAULIS Less.; F. B. I. iii. 416; E. D. L. 112. *Prenanthes procumbens* F. I. iii. 405.
Behar; Chota Nagpur; W. Bengal.
A perennial weed.

1129. LAUNEA PINNATIFIDA Cass.; F. B. I. iii. 417; E. D. L. 114. *Prenanthes aspleniifolia* F. I. iii. 404 partly.
Orissa, on the sand-dunes.
A perennial herb.

Order LXXII. STYLIDEÆ.

Herbs, rarely undershrubs. *Leaves* radical or alternate, or fascicled and spuriously whorled, entire; stipules 0. *Flowers* hermaphrodite or 1-sexual by abortion, in racemose cymes or panicles or corymbs; usually irregular. *Sepals* connate in a 2-lipped

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calyx, adnate to ovary; upper lip 3-lobed, lower 2-lobed. *Petals* connate in a 5-lobed, irregular corolla; lobes imbricated, the lowest usually dissimilar (lip). *Stamens* 2, the filaments discrete from corolla, connate in a column with the style; anthers sessile on the apex of column, their cells at length confluent at the tip. *Disk* small, epigynous, or obsolete. *Carpels* 2, connate in an inferior, 2-celled, or partially (basally) 1-celled ovary; ovules in each cell on the middle of the septum, numerous; stigma at apex of column. *Fruit* a 2-celled or (by absorption) 1-celled capsule, dehiscent at apex or only in the middle. *Seeds* many, rarely (by absorption) solitary, small; albumen fleshy; embryo minute.

504. **Stylidium** Sw.

Herbs with slender stems; *leaves* subrosulate or scattered. *Flowers* on many-flowered, rarely, 1-flowered peduncles or scapes; bracts paired or solitary. *Sepals* connate in a 5-lobed, often more or less 2-lipped calyx. *Petals* connate in an irregularly 5-lobed corolla, with 4 lobes erect in pairs, and a fifth smaller and recurved. *Stamens* 2, connate in an elongated column; apex at first deflexed, elastically recurved when irritated; stigma undivided. *Carpels* connate in a 2-locular ovary. *Fruit* a capsule; valves dehiscing from apex downwards, or opening in the middle but united at apex and base. *Seeds* minute; albumen fleshy.

Stems short, stout; leaves terminal, subrosulate; peduncles one or more, leafless, dichotomous; corolla white ....*Kunthii*.

Stems erect, slender, simple, leafy; leaves scattered; corolla rosy or purplish:—

  Stems 4–8 in. high; flowers rather numerous......................*tenellum*.

  Stems 1–2 in. high; flowers few, 1–4..............*tenellum* var. *minima*.

1130. Stylidium Kunthii Wall.; F. B. I. iii. 420.
N. Bengal; Chittagong.
A small herb of grassy places, 1–8 in. high.

1131. Stylidium tenellum Sw.; F. B. I. iii. 420.
E. Bengal; Chittagong.
A small herb of swamps and rice-fields.

1131/2. Var. minima Clarke; F. B. I. iii. 420.
Chota Nagpur.
A minute herb of wet places.

Order LXXIII. CAMPANULACEÆ.

Herbs or undershrubs, sometimes twining, often with milky juice. *Leaves* alternate or opposite, entire or toothed, rarely lobed; stipules 0. *Flowers* hermaphrodite, rarely by abortion 1-sexual, regular or irregular, axillary or terminal, solitary, racemose, or subpaniculate; uppermost leaves reduced to small bracts; bracteoles usually 0. *Sepals* more or less connate below in an inferior or superior calyx; limb 4–6-partite, usually persistent. *Petals* connate in a superior regular or irregular corolla, tubular, rotate, or campanulate; lobes as many as calyx-segments, valvate or induplicate in bud. *Stamens* 4–6, alternating with corolla-lobes, inserted with the corolla on the edge of an epigynous *disk*, rarely adnate to corolla-tube; anthers free or connate in a tube, their cells parallel; dehiscence longitudinal, introrse. *Carpels* connate in a 2–5-celled ovary; ovules many on axial placentas at the inner angle of the cells; style cylindric; stigmatic lobes as many as constituent carpels. *Fruit* a capsule or a berry, sometimes indehiscent and dry. *Seeds* very many, small, ellipsoid; albumen fleshy; embryo straight, axial.

Corolla 2-lipped, cleft dorsally to the base; anthers connate......**Lobelia.**
Corolla regular; anthers free or imperfectly connate :—
  Fruit an indehiscent berry; stigma lobed..................**Campanumœa.**
  Fruit opening by pores or valves :—
    Capsule only dehiscent within the calyx-teeth :—
      Capsule circumscissile, opening by the fall of an apical disk; flowers in dense spikes; stigma lobed ....**Sphenoclea.**
      Capsule dehiscing by 3–5 apical valves bearing the septa; flowers lax :—
        Stigma capitate; corolla rotate, deeply cleft, with linear lobes **Cephalostigma.**
        Stigma lobed; corolla campanulate ....**Wahlenbergia.**
    Capsule laterally dehiscent at the base or sides below the calyx-teeth; corolla campanulate; stigma lobed ....**Campanula.**

505. Lobelia Linn.

Herbs, sometimes tall; *leaves* alternate, toothed, rarely subentire. *Flowers* on axillary, 1-flowered, sometimes subracemose peduncles; bracts leafy; bracteoles small, often 0. *Sepals* connate in an adnate, turbinate, or obovoid calyx; limb 5-fid to

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5-partite; lobes slightly unequal. *Petals* connate in an oblique or incurved, 2-lipped corolla, upper lip 2-partite, lower 3-lobed. *Stamens* 5, connate in a tube, free from the corolla or nearly so; anthers connate round the style, all subequally bearded or the 2 lower tipped with bristles, the 3 upper naked. *Carpels* connate in an inferior, 2-celled ovary; placentas hemispheric; ovules many; stigma shortly 2-fid. *Fruit* a capsule, loculicidally 2-valved within the calyx-teeth. *Seeds* many, minute, ellipsoid, compressed or trigonous.

Anthers all subequally bearded on the apex; corolla small with unequal lobes:—
  Seeds distinctly 3-angled; pedicels usually longer than the ovate leaves; capsules rounded at the base or only faintly tapering into the pedicels:—
    Stems distinctly 3-cornered; prostrate and usually rooting, at east near base; pedicels only slightly longer than the leaves; seeds ellipsoid, narrowed at both ends:—
      Leaves glabrous, subsessile .... *trigona.*
      Leaves pilose on the nerves beneath, petioled .... *affinis.*
    Stem faintly 3-cornered; suberect, not rooting; leaves short-petioled, the upper small, bract-like; pedicels very long, slender seeds subspherical .... *terminalis.*
  Seeds ellipsoid, compressed; stem 3-cornered, often somewhat 3-winged; capsules lanceolate, triangular at base, tapering markedly into the pedicels; pedicels not longer than the subrhomboid leaves *trialata.*
Anthers 5, only the two lower bearded, the three upper naked; corolla 2-lipped, the lobes nearly equal in length; leaves linear or oblong-lanceolate .... *radicans.*

1132. LOBELIA TRIGONA Roxb.; F. I. i. 506; F. B. I. iii. 423 E. D. L. 509.

Chota Nagpur; N. and E. Bengal.

A small annual glabrous herb, branches 6–12 in. ascending, rooting at the base. *Santal.* Chauric' arak'.

1133. LOBELIA AFFINIS Wall.; F. B. I. iii. 424.

E. Bengal; Chittagong.

A small annual slightly pubescent herb, branches 6–24 in., many, rooting.

1134. LOBELIA TERMINALIS Clarke; F. B. I. iii. 424.

N. and E. Bengal.

A small suberect annual, 6–10 in. high, branches not rooting.

1135. Lobelia trialata Ham.; F. B. I. iii. 425.

Chota Nagpur.

A small, annual, glabrous herb, branches 6–15 in., ascending.

1136. Lobelia radicans Thunb.; F. I. i. 507.

Chota Nagpur; naturalised near Ranchi.

A procumbent herb.

506. **Campanumœa** Bl.

Perennial herbs; root tuberous; stem erect or twining or sarmentose, with long, straight branches; *leaves* opposite or alternate, short- or long-stalked, entire, crenate or serrate. *Flowers* peduncled, solitary, lateral or terminal; bracts 0. *Sepals* connate in an inferior or superior calyx; limb with 4–6 long, broad or narrow, persistent lobes. *Petals* connate in an epigynous, campanulate corolla, white with a short tube, or lurid, large, with a long tube; lobes 4–6. *Stamens* 4–6, inserted round base of corolla-tube. *Carpels* connate in a 4–6-celled ovary; placentas thick, many-ovuled; style cylindric; stigma of 4–6 short lobes. *Fruit* an indehiscent, truncate berry. *Seeds* numerous, ellipsoid, small.

1137. Campanumœa celebica Bl.; F. B. I. iii. 436. *Campanula lancifolia* F. I. i. 505.

Chittagong.

An erect perennial, 3–4 feet high, branches long, horizontal, and drooping; leaves opposite, lanceolate.

507. **Sphenoclea** Gaertn.

An annual, erect herb; *leaves* alternate, lanceolate, entire. *Flowers* small, sessile, in lateral and terminal peduncled, dense, cylindric spikes, with a conical apex; bracts distinct; bracteoles 2. *Sepals* connate in a half-superior calyx; limb 5-fid; lobes ovate. *Petals* 5, connate in an epigynous, campanulate, 5-lobed corolla. *Stamens* 5, adnate to corolla-tube, alternate with its lobes; filaments short, linear; anthers ovate. *Carpels* connate in a 2-celled ovary, at first inferior; placentas stalked; ovules very many; style short; stigma obscurely 2-lobed. *Fruit* a half-inferior capsule, membranous below, the crown above the calyx-limb hard,

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depressed-conical, circumscissile. *Seeds* numerous, narrowly oblong; testa rather lax.

1138. Sphenoclea zeylanica Gaertn.; F. I. i. 507; F. B. I. ii. 438.

In nearly all the provinces, in swamps.

An annual erect herb. *Beng.* Jhil-mirich.

508. **Cephalostigma** A. DC.

Small, erect, branched herbs, sparsely patently hairy; *leaves* alternate, subsessile, margin thickened, entire, waved or crisped. *Flowers* small, racemed or panicled; pedicels filiform; upper bracts very small. *Sepals* connate in a superior calyx; limb 5-partite. *Petals* connate in a deeply 5-fid corolla; segments linear-lanceolate, stellately patent, blue or whitish. *Stamens* 5, free from the corolla; filaments dilated at the base; anthers free. *Carpels* connate in a subglobose, 2–3-celled, inferior ovary; placentas many-ovuled; style cylindric; stigma shortly obtusely 3-lobed. *Fruit* a loculicidally 2–3-valved capsule, opening within the persistent calyx-teeth. *Seeds* numerous, small, ellipsoid, compressed, or trigonous.

Seeds oblong-ellipsoid, compressed, not trigonous; calyx-tube patently hairy; teeth linear-lanceolate, nearly glabrous..................... *Schimperi.*
Seeds distinctly trigonous:—
  Calyx-tube and linear-lanceolate teeth both patently pilose ...*hirsutum.*
  Calyx-tube and shortly-triangular teeth both glabrous or nearly so *Hookeri*

1139. Cephalostigma Schimperi Hochst.; F. B. I. iii. 428.

Chota Nagpur.

An erect, branching herb, 4–15 in. high.

1140. Cephalostigma hirsutum Edgew.; F. B. I. iii. 429.

Chota Nagpur.

A rather rigid herb, 1–5 in. high.

1141. Cephalostigma Hookeri Clarke; F. B. I. iii. 429.

Chota Nagpur.

An erect herb, 3–8 in. high.

509. **Wahlenbergia** Schrad.

Annual or perennial herbs; *leaves* alternate or opposite. *Flowers* on terminal or leaf-opposed, solitary or panicled peduncles; bracts minute or 0. *Sepals* connate in a superior calyx; limb 5-partite. *Petals* 5, connate in a campanulate corolla, sometimes the lobes almost free to the base. *Stamens* 5, free from the corolla; filaments often dilated near the base; anthers oblong, free. *Carpels* connate in an inferior, turbinate, 2–3-celled ovary; placentas many-ovuled; style cylindric; stigma of 3 narrow lobes. *Fruit* an erect, 2–3-celled capsule, opening loculicidally by 2–3 valves within the persistent calyx-teeth. *Seeds* very many, minute.

1142. WAHLENBERGIA GRACILIS DC.; F. B. I. iii. 429. *Campanula dehiscens* F. I. i. 504.

Chota Nagpur; Behar; Tirhut; N. Bengal; Chittagong.

A slender herb, simple or branched, usually glabrous.

510. **Campanula** Linn.

Perennial or annual, erect or decumbent herbs; *leaves* alternate, or the radical subrosulate, from ovate to linear. *Flowers* peduncled or subsessile, axillary or terminal, panicled, spicate or subcapitate, purple or white; bracts minute or 0. *Sepals* connate in a turbinate calyx, adnate to the ovary; limb deeply 5-lobed, persistent. *Petals* 5, connate in a campanulate corolla; limb shortly lobed. *Stamens* 5, free; filaments dilated at the base; anthers free. *Carpels* connate in an inferior ovary, 3- or rarely 4–5-celled; ovules numerous in each cell; style cylindric; stigma shortly 3–5-lobed. *Fruit* an obovoid or elongated capsule, dehiscing by small valves at the base or on the sides below the calyx-lobes. *Seeds* very many, minute, ellipsoid or compressed and margined.

1143. CAMPANULA CANESCENS Wall.; F. B. I. iii. 439.

Chota Nagpur; Behar; Tirhut; N. Bengal.

An erect, hirsute herb.

Order LXXIV. VACCINIACEÆ.

Shrubs or small trees, sometimes epiphytic, with the stem much thickened at the base. *Leaves* alternate or spuriously whorled, entire or serrate; stipules 0. *Flowers* hermaphrodite, regular; racemed or solitary axillary; pedicels 1-bracteate and often 2-bracteolate, frequently thickened and articulate beneath the ovary. *Sepals* connate in an ovoid calyx-tube, adnate to the

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ovary; limb 5-fid, rarely entire, usually persistent. *Petals* connate in a tubular or urceolate 5-toothed or shortly campanulate 5-fid, deciduous corolla. *Disk* epigynous. *Stamens* 10, epigynous, free; anthers subbasally dorsifixed; cells opening by apical pores, often produced upwards into 2 tubes, opening by apical chinks; connective sometimes spurred behind. *Carpels* 5, connate in an inferior 5-celled or spuriously 10-celled ovary; ovules usually many at inner angles of cells; style cylindric; stigma simple. *Fruit* a 5- or falsely 10-celled berry, rarely dry and indehiscent. *Seeds* several or many, rarely one in each cell, small, compressed; albumen fleshy; embryo minute, clavate.

511. **Agapetes** D. Don.

Shrubs, often epiphytic; stems often greatly thickened at the base; *leaves* alternate, sometimes falsely whorled, from linear to elliptic, entire or toothed, sessile or shortly petioled, often with glands at the apex of the petiole, usually coriaceous. *Flowers* axillary, corymbose, fascicled or solitary; pedicel often thickened or articulate under the ovary; bracts small. *Sepals* connate in a globose calyx, with a persistent 5-fid or 5-partite limb. *Petals* 5, connate in a shortly or deeply 5-lobed corolla; red, but often with transverse marks or the lobes greenish-white. *Stamens* 10; filaments usually short; anthers elliptic, produced upwards in 2 long beaks opening by apical pores or slits, often spurred behind. *Carpels* connate in a 5-celled or spuriously 10-celled inferior ovary; ovules very many at the inner angles of the cells; style cylindric; stigma capitate. *Fruit* a globose, succulent, or almost dry berry, 5-celled or spuriously 10-celled, often opening by 10 pores round the disk within the calyx-teeth. *Seeds* very many, ellipsoid, with very lax testa.

Anthers with spurs on their beaks ....*variegata.*
Anthers without spurs on their beaks ....*macrantha.*

1144. Agapetes variegata D. Don; F. B. I. iii. 446.
Chittagong.
An epiphytic shrub. *Beng.* Jalamut.

1145. Agapetes macrantha Hook. f.; F. B. I. iii. 446. *Ceratostema variegatum* F. I. ii. 413.
Chittagong.
An epiphytic shrub. *Beng.* Jalamut.

Order LXXV. PLUMBAGINEÆ.

Herbs, undershrubs, or shrubs. *Leaves* rosulate or alternate, petiole sometimes dilated and stem-clasping below. *Flowers* hermaphrodite, regular, in terminal scapes or peduncles, capitate, racemed or panicled; bracts often with scarious margins, usually sheathing the flowers; bracteoles 2. *Sepals* connate in an inferior, tubular, 5–10-ribbed calyx, often hyaline between the ribs; limb frequently funnel-shaped, scarious. *Petals* 5, free, or connate at the base in a short tube to which the filaments are adnate, rarely connate in a linear tube; lobes imbricate, spreading. *Stamens* 5, opposite the petals; filaments adnate below to the corolla, or nearly free; anthers oblong, dorsifixed; cells parallel; dehiscence longitudinal. *Disk* 0. *Carpels* connate in a superior 1-celled ovary, 5-angled above; ovule solitary, anatropous, pendulous from an ascending basal funicle; styles 5, free or connate below; stigmas subcapitate. *Fruit* a membranous or partially coriaceous capsule, included in the calyx or exserted; circumscissile or rupturing near the thin base, the hardened apex open, 5-valved. *Seed* cylindric, pendulous; albumen floury or 0; embryo straight.

Styles 5, distinct; stigmas subcapitate; stamens shortly united at the base into a tube with the corolla; a large shrub ....**Ægialitis.**
Style 1, filiform, divided into 5 stigmatose branches; stamens free; herbs or undershrubs ....**Plumbago.**

512. Ægialitis R. Br.

A glabrous shrub; *leaves* alternate, broad, coriaceous; petiole dilated at the base, stem-clasping. *Flowers* in panicled racemes; bract sheathing the pedicel and enclosing the two bracteoles. *Sepals* connate in a tubular, coriaceous, 5-ribbed calyx; limb shortly 5-toothed. *Petals* linear, white, connate below, and there adnate to filaments, in a persistent tube, deciduous above the tube. *Stamens* 5; anthers oblong. *Carpels* connate in a superior 1-celled ovary; styles 5, distinct, projecting from the angles of the ovary; stigmas capitate. *Fruit* a linear, exserted capsule, dehiscing along the angles. *Seed* solitary, elongated; albumen 0.

1146. ÆGIALITIS ROTUNDIFOLIA Roxb.; F. I. ii. 111; F. B. I. iii. 479; E. D. A. 529.

CSL

Sundribuns.

A glabrous shrub of mangrove-swamps, with broad, coriaceous leaves, and a stem-clasping, dilated petiole.

513. **Plumbago** Linn.

Herbs or undershrubs, diffusely branching; *leaves* alternate, entire. *Flowers* spicate; bracts and 2 bracteoles short. *Sepals* connate in a tubular calyx, covered with stalked glands; limb 5-fid. *Petals* 5, connate in a long, slender, tubular corolla; lobes round, patent. *Stamens* 5, free; filaments linear, dilated at the base; anthers oblong. *Carpels* connate in an ovary, narrowed at the base; style slender, with terminal branches, stigmatic nearly throughout their length. *Fruit* a membranous capsule, circumscissile near the base. *Seed* solitary; albumen scanty.

Leaves ovate, suddenly narrowed into the petiole; rachis of spike pubescent or glandular; corolla white; base of style glabrous...*zeylanica*.
Leaves elliptic, tapering to the short petiole; rachis of spike glabrous; corolla red; base of style hairy..*rosea*.

1147. PLUMBAGO ZEYLANICA Linn.; F. I. i. 462; F. B. I. iii. 480; E. D. P. 986.

In most of the provinces, as if wild; but usually cultivated.

A rambling herb. *Vernac.* Chita, chitra.

1148. PLUMBAGO ROSEA Linn.; F. I. i. 462; F. B. I. iii. 481; E. D. P. 979.

Cultivated in all the provinces; as if wild only in Chittagong.

A rambling herb. *Vernac.* Lal-chita, rakto-chitra.

Order LXXVI. PRIMULACEÆ.

Perennial, rarely annual herbs. *Leaves* all radical, or, if cauline, opposite, alternate, or whorled; stipules 0. *Flowers* hermaphrodite, regular, small or large, axillary, solitary, or racemose, or solitary or umbellate at the apex of an elongated scape; bracts variable, sometimes obsolete or 0. *Sepals* connate in an inferior 5-, rarely 4–9-cleft calyx, rarely superior. *Petals* connate in a hypogynous, very rarely superior, rotate, campanulate or funnel-shaped tube; limb 5-, rarely 4–9-cleft; lobes imbricate or contorted; corolla very rarely 0. *Stamens* on the corolla-tube opposite its lobes, or hypogynous where corolla 0, with sometimes alternating staminodes; filaments usually short; anthers 2-celled; dehiscence longitudinal. *Carpels* connate in a 1-celled ovary, almost always superior; ovules many, usually amphitropous on a free-central placenta; style long or short; stigma entire. *Fruit* a capsule, dehiscing transversely or by valves. *Seeds* few or many, usually angular, often sunk in the placenta; albumen fleshy or horny; embryo transverse.

Corolla-lobes imbricated; capsule dehiscing by valves.........**Androsace.**
Corolla-lobes contorted; capsule circumscissile:—
  Corolla 5-partite, longer than the calyx; leaves opposite ...**Anagallis.**
  Corolla 4–5-lobed, shorter than the calyx; leaves alternate
Centunculus.

514. **Androsace** Linn.

Perennial, rarely annual, low herbs; *leaves* rosulate or imbricate on the branches. *Flowers* small, red or white. *Sepals* connate in a 5-lobed or 5-partite calyx. *Petals* connate in a short-tubed, salver-shaped or funnel-shaped corolla; limb 5-lobed; throat annulate or with folds opposite the lobes. *Stamens* 5; anthers subsessile, included in the tube, obtuse. *Carpels* connate in a globose ovary; style short. *Fruit* an ovoid or globose, 5-valved capsule. *Seeds* 2, rarely more, angular or subglobose; embryo transverse.

1149. ANDROSACE SAXIFRAGÆFOLIA Bunge; F. B. I. iii. 496.
Tirhut; N. and C. Bengal.
An annual herb.

515. **Anagallis** Tournef.

Slender annual or perennial herbs; *leaves* opposite, quite entire. *Flowers* axillary, solitary, peduncled, red or blue, rarely white; bracts 0. *Sepals* connate in a 5-partite calyx. *Petals* 5, connate in a rotate, 5-partite corolla. *Stamens* 5, adnate to corolla-tube; filaments villous. *Carpels* connate in a globose ovary; style filiform; ovules many. *Fruit* a globose, circumscissile capsule. *Seeds* many, peltate, plano-convex.

1150. ANAGALLIS ARVENSIS Linn.; F. B. I. iii. 506; E. D. A. 1034.

Tirhut; Behar; Chota Nagpur; N. and C. Bengal.
An annual procumbent herb with opposite, gland-dotted leaves and *blue* flowers. The scarlet-flowered form of the Pimpernel has not been met with in our area.

516. Centunculus Linn.

Small annual herbs; *leaves* alternate or subopposite. *Flowers* minute, solitary, axillary, white or pink; bracts 0. *Sepals* connate in a 4–5-partite calyx. *Petals* 4–5, connate in a short, urceolate corolla. *Stamens* 4 or 5, adnate to throat of corolla; filaments flattened; anthers exserted. *Carpels* connate in a subglobose ovary; style filiform; ovules numerous. *Fruit* a globose, circumscissile capsule. *Seeds* many, peltate.

1151. CENTUNCULUS TENELLUS Duby; F. B. I. iii. 506.
Behar; W. Bengal; Chota Nagpur.
A very small annual herb.

Order LXXVII. MYRSINEÆ.

Shrubs or small trees. *Leaves* alternate, undivided, generally gland-dotted; stipules 0. *Flowers* regular, hermaphrodite or polygamo-diœcious, in cymes, racemes, or umbels. *Sepals* connate in an inferior calyx, rarely somewhat adnate to ovary; limb usually 5-, sometimes 4- or 6-lobed, persistent, sometimes slightly accrescent. *Petals* connate in a short tube or free; 3–7 (usually 5), contorted or imbricate, rarely valvate. *Stamens* 3–7, opposite the corolla-lobes, free or adnate to the tube, very rarely with alternating staminodes; anthers usually oblong, acute; usually free, sometimes connate by their margins; dehiscence longitudinal, rarely porous. *Carpels* connate in an oblong, free, or rarely half-inferior, 1-celled ovary, tapering upwards into the style; ovules many, on a free central placenta; style filiform or columnar; stigma simple or rarely shortly lobed. *Fruit* a small, globose, indehiscent, 1- or, less often, several-seeded berry, rarely (*Ægiceras*) a linear, acute, one-seeded follicle. *Seeds* usually globose, excavated at the base; albumen pitted or ruminate; embryo transverse.

*Calyx nearly enclosing the many-seeded berry; seeds albuminous [p. 642] .... **Mæsa.**

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*Calyx free from the 1-seeded fruit:—[p. 641]

Fruit a globular drupe; anthers not transversely chambered; flowers in racemes or panicles; seed spherical, albuminous:—

Corolla-lobes imbricate in bud, or if (rarely) contorted the anthers not longer than the filaments, the ovules few, and the stems usually climbing; flowers very small ....**Embelia.**

Corolla-lobes contorted in bud; anthers longer than the filaments; ovules many; stems erect..**Ardisia.**

Fruit a dry, curved, cylindric, irregularly opening follicular drupe; anthers transversely chambered; flowers in umbels; seed elongate, germinating on the tree, exalbuminous ....**Ægiceras.**

517. Mæsa Forsk.

Trees or shrubs; *leaves* entire or serrate. *Flowers* small, hermaphrodite or 1-sexual, 4–5-merous, in axillary or terminal racemes; bracts at base of pedicels small; bracteoles 2. *Sepals* connate in a half-inferior or sometimes almost free calyx, always semi-adnate in fruit; teeth 4–5, small, persistent. *Petals* connate in a small, campanulate, gamopetalous corolla; lobes 4–5, round, much imbricate, sometimes unequal. *Stamens* 5, inserted on the corolla-tube; filaments short; anthers ellipsoid; staminodes 0. *Carpels* connate in an ovary, adnate below to the calyx; style short, often sulcate; stigma capitate or shortly 3–5-lobed; ovules numerous on a globose, central, free placenta. *Fruit* a small, globose berry, dry or fleshy. *Seeds* numerous, subtrapezoid.

Leaves entire; racemes compound, often longer than the leaves *ramentacea.*

Leaves with 1–3 teeth to each primary nerve; racemes compound, shorter than the leaves ....*indica.*

1152. MÆSA RAMENTACEA A. DC.; F. B. I. iii. 508. *Bæobotrys ramentacea* F. I. i. 558.

Chittagong.

An erect tree, 30 feet high.

1153. MÆSA INDICA Wall.; F. B. I. iii. 509; E. D. M. 40. *Bæobotrys indica* F. I. i. 557. *B. nemoralis* F. I. i. 559.

Chittagong.

A shrub, a small tree. *Beng.* Ramjani; *Magh.* Tamomban.

518. Embelia Burm.

Shrubs, usually sarmentose, or small trees; *leaves* entire or toothed; petiole often margined or glandular. *Flowers* small, polygamous, mostly diœcious, white or greenish-yellow, in axillary or terminal, simple or compound racemes, or subfascicled; bracts usually small; bracteoles 0. *Sepals* connate in a small, free, persistent, 5-lobed or 4-lobed calyx. *Petals* 5 or 4, free or slightly connate at the base, elliptic, imbricate or rarely contorted in bud. *Stamens* 5 or 4, the filaments opposite and more or less adnate to the petals; anthers ovate-oblong. *Carpels* connate in an ovoid or globose, rarely conic ovary; style cylindric; stigma capitellate; ovules few. *Fruit* a small, globose, 1-seeded or rarely 2-seeded berry. *Seed* globose, with hollowed base; albumen subruminate, pitted; embryo curved.

Leaves glabrous, entire; inflorescence terminal as well as axillary; panicles grey-pubescent; pedicels longer than the flowers and fruits; filaments short and thick .... *Ribes*.

Leaves pubescent beneath, at least on the nerves, undulate or obscurely serrulate; inflorescence axillary only; racemes rusty-pubescent; pedicels shorter than the flowers and fruits; filaments slender, longer than anthers .... *robusta*.

1154. Embelia Ribes Burm.; F. I. i. 586; F. B. I. iii. 513; E. D. E. 199.

Chittagong.

A scandent shrub. *Hind.* Baberáng; *Beng.* Bhai-birrung.

1155. Embelia robusta Roxb.; F. I. i. 586; F. B. I. iii. 515; E. D. E. 202.

Behar; Chota Nagpur; W. Bengal; E. Bengal, Mymensingh.

A large, rambling shrub, or small tree with sprawling branches. *Hind.* Baberáng; *Beng.* Bhai-birrung; *Uriya* Baibidanga.

519. Ardisia Sw.

Shrubs or small trees; *leaves* petioled. *Flowers* hermaphrodite, in axillary or terminal, simple or compound umbels or racemes; bracts small, deciduous, very rarely persisting. *Sepals* connate in a 5-lobed, rarely 4-lobed calyx, persistent and sometimes accrescent in fruit. *Petals* connate in a red, white, or speckled 5-partite corolla; lobes acute, twisted to the right in bud. *Stamens* 5; filaments very short, adnate to corolla; anthers free, ovate-lanceolate, acute. *Carpels* connate in a globose ovary, narrowed to the apex; style cylindric, often exceeding the corolla-lobes; stigma small, terminal; ovules few. *Fruit* a globose or subglobose, 1-seeded berry. *Seed* globose; albumen pitted or ruminate; embryo transverse.

Flowers in truly or spuriously terminal panicles:—
  Panicles truly terminal, at least twice divided, their branches more or less flattened; pedicels densely umbelled; leaves entire:—
    Leaves coriaceous, decurrent on the stout petiole, the main-nerves diverging at an acute angle; panicle almost glabrous, its branches angular; calyx-lobes small, round ....*paniculata.*
    Leaves thickly chartaceous, not decurrent, the main-nerves diverging almost at a right-angle; panicle branches scaly, much flattened; calyx-lobes elliptic-oblong........................*colorata* var. *complanata.*
  Panicles in appearance terminal, the axis of a branch ending in an apical tuft of reduced leaves, between which and the normal leaves spring several peduncles bearing rusty panicles; leaves distinctly crenulate; calyx-lobes narrow, acute ....*Icara.*
Flowers in axillary umbels, at least the lower peduncled, but without reduced leaves at the apex of the peduncles; leaves and flowers glabrous; margin of leaves entire or subentire:—
  Leaves obovate-lanceolate, primary nerves conspicuous beneath; branchlets tawny-woolly ....*khasiana* var. *Thomsoni.*
  Leaves obovate-oblong or elliptic; nerves slender; branchlets glabrous *humilis.*

1156. Ardisia paniculata Roxb.; F. B. I. iii. 519; E. D. A. 1292.

E. Bengal; Chittagong.

A large shrub.

1157. Ardisia colorata Roxb. var. complanata Clarke; F. B. I. iii. 520; E. D. A. 1284.

Chittagong.

A small tree.

1158. Ardisia Icara Ham.; F. B. I. iii. 523.

E. Bengal, Mymensingh.

A large shrub.

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1159. Ardisia khasiana Clarke var. Thomsoni Clarke; F. B. I. iii. 527.

Chittagong.

A small erect shrub, 1–4 feet high.

1160. Ardisia humilis Vahl; F. B. I. iii. 529; E. D. A. 1288. *A. solanacea* F. I. i. 580.

In almost every province.

An erect, branched shrub, sometimes almost tree-like. *Beng.* Ban-jám; *Uriya* Kudna; *Hind.* Bisi.

520. Ægiceras Gaertn.

A small, glabrous tree, with cylindric branches; *leaves* alternate, petioled, obovate, entire, coriaceous, 1-nerved. *Flowers* hermaphrodite, white, with filiform pedicels, in sessile, axillary, terminal or leaf-opposed umbels; bracts 0. *Sepals* connate in a 5-lobed calyx; lobes imbricate. *Petals* 5, connate below in a short tube, free above, acute, twisted to the right in bud. *Stamens* 5, adnate to corolla-tube; filaments linear, hirsute at base; anthers cordate-lanceolate, with longitudinal dehiscence; cells transversely septate. *Carpels* connate in an oblong ovary, narrowed into a filiform style; stigma minute, terminal; ovules many, immersed in a globose, central placenta. *Fruit* a cylindric, curved, acute, coriaceous, striated, 1-seeded follicle. *Seed* conform to the fruit, germinating within the pericarp; albumen 0; radicle inferior, much elongated, enlarged at the base; cotyledons very short.

1161. Ægiceras majus Gaertn.; F. I. iii. 130; F. B. I. iii. 533; E. D. A. 531.

Orissa, Mahanadi Delta; Sundribuns.

A large shrub or small tree in mangrove-swamps. *Vernac.* Halsi, khalsi.

Order LXXVIII. SAPOTACEÆ.

Trees or shrubs; young parts often rusty-tomentose. *Leaves* alternate or rarely subopposite, petioled, entire, coriaceous; stipules 0 or very caducous. *Flowers* hermaphrodite, small or medium, axillary; pedicels clustered, rarely solitary, very rarely panicled; bracts 0; bracteoles 0 or minute. *Sepals* connate in a calyx, with 4–8 much-imbricate lobes, subequal or the inner larger, sometimes distinctly 2-seriate, the inner row imbricate, the outer valvate, persistent. *Petals* connate in a tube, shorter than the calyx, the lobes equal, as many or 2–4 times as many as calyx-lobes. *Stamens* inserted on the corolla-tube, 1-seriate, and as many as and opposite the corolla-lobes, or 2–3-seriate and twice or thrice as many as corolla-lobes; filaments usually short; anthers oblong-lanceolate, connective often produced; staminodes, when present, alternate with stamens and corolla-lobes. *Carpels* connate in a superior, sessile, 2–8-celled ovary; ovules solitary in each cell, usually arising from inner angle; style subulate; stigma minute. *Fruit* a 1–8-seeded berry. *Seeds* ellipsoid or, especially if more than one, compressed; testa usually crustaceous; hilum long; albumen 0 and embryo with fleshy cotyledons, or fleshy and embryo with flat cotyledons; radicle small.

Corolla-lobes and calyx-lobes equal in number :—
  Calyx-segments in one series only; parts of the flower in whorls of 5; stamens as many as petals; staminodes as many as stamens and alternating with them; seeds not albuminous :—
    Flowers sessile in branched panicles; ovary glabrous; cells 1–2 **Sarcosperma.**
    Flowers pedicelled in axillary fascicles; ovary villous; cells 4–5 **Sideroxylon.**
  Calyx-segments in two distinct series; parts of the flower in whorls of 6 :—
    Stamens as many as petals; staminodes as many as stamens and alternating with them; ovary-cells twice as many as petals; seeds albuminous .... **Achras.**
    Stamens twice as many as petals; staminodes 0; ovary-cells as many as petals; seeds not albuminous .... **Dichopsis.**
Corolla-lobes more numerous than calyx-lobes; ovary-cells as many as calyx-lobes :—
  Staminodes none; stamens about 2–3 times as many as corolla-lobes, in 1–3 series; corolla-lobes 8–14; calyx-lobes and ovary-cells 4 or 6; seeds not albuminous .... **Bassia.**
  Staminodes 6 or 8; stamens also 6–8, fewer than corolla-lobes; corolla-lobes 18–24, in 2–3 series; calyx-lobes and ovary-cells 6 or 8; seeds albuminous .... **Mimusops.**

521. Sarcosperma Hook. f.

Trees; *leaves* subopposite, oblong, acuminate, coriaceous; stipules caducous. *Flowers* small, fascicled on the branches of simple or compound panicles; bracteoles minute. *Sepals* 5, connate below, orbicular, subequal, strongly imbricate. *Petals* 5, connate below in a short tube, orbicular, imbricate. *Stamens* 5, adnate to corolla-tube; filaments short; anthers oblong, obtuse; staminodes 5, small, oblong-linear. *Carpels* connate in a glabrous, 2- or 1-celled ovary; ovules ascending; style cylindric. *Fruit* a large, ellipsoid berry, 2-celled or 1-celled. *Seeds* 2 or solitary; testa crustaceous; hilum nearly basal; albumen 0; embryo fleshy.

1162. SARCOSPERMA ARBOREUM Hook. f.; F. B. I. iii. 535; E. D. S. 877.

N. Bengal, Duars.

A large, spreading tree.

522. **Sideroxylon** Linn.

Trees; *leaves* alternate, lanceolate, elliptic, or obovate; stipules 0. *Flowers* small, in axillary fascicles, subsessile or shortly pedicelled; pedicels more or less hirsute; fascicles sometimes in axillary racemes; bracteoles minute or 0. *Sepals* 5, connate below, subequal, much imbricated. *Petals* 5, connate in a campanulate tube; lobes imbricate. *Stamens* 5, attached to base of corolla-lobes; filaments short or linear; anthers ovate or lanceolate; staminodes 5, lanceolate, alternate with corolla-lobes. *Carpels* connate in a villous, or rarely almost glabrous 5-celled, more rarely 4–2-celled ovary; style cylindric, short or long. *Fruit* an ovoid or globose berry, with usually 4 or 5, but sometimes 3, 2, or 1 seeds. *Seeds* usually oblong, much compressed; testa hard; hilum long; albumen fleshy; embryo with leafy or almost fleshy cotyledons.

1163. SIDEROXYLON TOMENTOSUM Roxb.; F. I. i. 602; F. B. I. iii. 538; E. D. S. 1718.

Behar; W. Bengal; Chota Nagpur; Orissa.

A considerable tree. *Uriya* Kanta buhol.

523. **Achras** Linn.

An evergreen tree; *leaves* petioled, clustered at ends of branches, coriaceous, shining, glabrous or sparsely hairy; stipules 0. *Flowers* rather large, usually solitary, on axillary pedicels; bracts 0. *Sepals* 6, connate below, free and biseriate above, the 3 outer subvalvate, enclosing the 3 imbricate inner. *Petals* 6, con-

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nate in a wide, almost urceolate corolla; lobes imbricate, almost contorted. *Stamens* 6, adnate near base of corolla, opposite the lobes; filaments slender, reflexed above; anthers lanceolate; staminodes 6, petaloid, alternate with and nearly as long as corolla-lobes. *Carpels* connate in a villous, 10–12-celled ovary; style cylindric or thickened in the middle, glabrous; stigma small. *Fruit* a fleshy berry, globose or 5-angled. *Seeds* usually few, oblong; hilum lateral; testa hard; albumen fleshy; embryo with thick, flat cotyledons.

1164. ACHRAS SAPOTA Linn.; F. B. I. iii. 534; E. D. A. 376.

Cultivated.

A medium tree, native of America, cultivated for its edible fruit. *Vernac.* Sapota (*from the American name*). The Sapota.

524. **Dichopsis** Thwaites.

Trees; shoots rusty-tomentose; *leaves* obovate or oblong, petioled, coriaceous; stipules 0. *Flowers* fascicled, axillary, or on the naked branchlets below a terminal tuft of leaves; pedicelled. *Sepals* 6, connate below, free and biseriate above, the three outer lobes valvate, enclosing the 3 imbricate inner. *Petals* 6, more or less connate, imbricate or almost contorted. *Stamens* 12, attached near base of corolla, or alternately opposite corolla-lobes and near the base and alternate with the lobes and higher up, occasionally from 13–18; filaments short or long; anthers lanceolate, connective produced, acute or 2-fid, staminodes 0. *Carpels* connate in a villous, usually 6-celled ovary; style linear. *Fruit* a fleshy, ellipsoid, or ovoid berry. *Seeds* 2 or solitary; testa crustaceous; albumen 0; cotyledons large, fleshy.

1165. DICHOPSIS POLYANTHA Hook. f.; F. B. I. iii. 542; E. D. D. 392.

Chittagong.

A tree, 30–40 feet high, said to yield a good gutta-percha. *Beng.* Tali.

525. **Bassia** Linn.

Deciduous trees; *leaves* petioled, coriaceous, silky or tomentose beneath when young, clustered at ends of branches; stipules caducous. *Flowers* on axillary pedicels, among the clustered leaves or in the axils of fallen leaves. *Sepals* 4, 2-seriate above, connate at base, the two outer valvate, enclosing the inner overlapping pair, very rarely 5, imbricate. *Petals* connate in a campanulate tube; lobes 6–12, usually 8 or 10, contorted in bud. *Stamens* at least twice as many as the corolla-lobes, from 12–40, but usually 16–20; anthers lanceolate, acute, connective often mucronate or excurrent. *Carpels* connate in a villous ovary; style linear; cells 4–12, but usually 6 or 8. *Fruit* a globose, oblong or ellipsoid, 1–3-, rarely 4–5-seeded berry. *Seed* ellipsoid; hilum long; albumen 0; cotyledons fleshy, semi-ellipsoid.

1166. BASSIA LATIFOLIA Roxb.; F. I. ii. 526; F. B. I. iii. 544; E. D. B. 220.

W. Bengal; Behar; Chota Nagpur; Orissa.

A tree, 50 feet high. *Hind.* Mahua; *Beng.* Mahwa, mahula; *Uriya* Moha; *Santal.* Matkom; *Kol.* Mankadum. The Mahua.

526. Mimusops Linn.

Trees; *leaves* elliptic or obovate, coriaceous; primary nerves many, subparallel, spreading from the midrib, slender or obscure. *Flowers* axillary, pedicelled, solitary or fascicled. *Sepals* 6 or 8, connate below, free and 2-seriate above; outer lobes 3 or 4, valvate, the inner 3 or 4 imbricate. *Petals* connate in a short tube; lobes 2–3-seriate, from 18–24. *Stamens* 6–16, usually either 6 or 8, inserted near base of corolla, opposite the lobes of the inner series; filaments short; anthers lanceolate, connective excurrent; staminodes as many as the stamens, entire or serrate or lobed. *Carpels* connate in a hirsute, 6–8-celled ovary; style cylindric. *Fruit* a globose berry with crustaceous endocarp. *Seeds* 1–6, compressed, ellipsoid; albumen fleshy; cotyledons flat, often nearly as wide as the seed.

1167. MIMUSOPS ELENGI Linn.; F. I. ii. 236; F. B. I. iii. 548; E. D. M. 570.

Cultivated generally.

A tree 50 feet high, with spreading branches. *Hind.* Malsari; *Beng.* Bakul; *Uriya* Baulo. Elengi.

Order LXXIX. EBENACEÆ.

Trees or shrubs, wood usually hard and heavy. *Leaves* alternate, rarely subopposite, entire, usually coriaceous; stipules 0.

Flowers usually diœcious, regular, axillary, sessile, or shortly cymose, usually bracteate; pedicels articulate. *Sepals* connate in an inferior calyx; lobes 3–7, valvate, imbricate, or contorted, often accrescent. *Petals* connate in a variously shaped tube; lobes 3–7, contorted, or less often imbricate or valvate. *Stamens* in ♂ and ☿ flowers 1-seriate and as many as corolla-lobes, or 2–more-seriate and 2-several times as many; filaments shorter than anthers, free or paired or variously connate below; anthers narrow; dehiscence longitudinal, rarely apical, connective often apiculate; in ♀ flowers stamens absent or reduced to staminodes, with abortive or empty anthers. *Disk* 0. *Carpels* in ♂ flowers reduced to an abortive ovary or absent; in ☿ or ♀ flowers connate in a superior sessile ovary with 2–8 styles, the cells as many or twice as many as the styles, imperfectly septate; ovules twice as many as the styles, pendulous, anatropous, attached to inner angles of cells. *Fruit* a coriaceous or fleshy berry, several- or few-seeded. *Seeds* pendulous, usually oblong, longitudinally 2–3-furrowed; testa thin; albumen copious, uniform or ruminated; embryo axial; radicle superior.

Flowers 3-merous; ovary 3- or 6-celled.................................**Maba.**
Flowers 4–5-merous; ovary 4–5- or 8–10-celled ....**Diospyros.**

527. **Maba** Forst.

Trees or shrubs; *leaves* alternate, entire. *Flowers* diœcious, axillary, short-pedicelled, or in small, dense cymes; whorls usually 3-merous, rarely 4–5-merous. *Sepals* 3, less often 4–5, connate in a 3–5-fid or -partite, rarely subtruncate calyx, often cupuliform and enlarged in fruit. *Petals* 3, connate below in a tube usually longer than the calyx, free above, contorted dextrorsely in bud. ♂ *Stamens* 3–22; filaments distinct or paired or polyadelphous; anthers oblong. *Ovary* rudimentary. ♀ *Staminodes* 0–12. *Carpels* connate in a 3-celled or imperfectly or perfectly 6-celled ovary; ovules 6; styles or style-arms 3. *Fruit* a globose or ellipsoid, glabrous or hairy, 1–6-celled and 1–6-seeded, dry or fleshy berry. *Seeds* with equable albumen.

1168. MABA BUXIFOLIA Pers.; F. B. I. iii. 551; E. D. M. 3.
Ferreola buxifolia F. I. iii. 790.
Orissa, in dry hills.
A small tree. *Uriya* Guaholi, pisina.

528. Diospyros Linn.

Trees or rarely shrubs; *leaves* alternate or, rarely, subopposite, entire. *Flowers* diœcious, very rarely polygamous, axillary and short-pedicelled or in small cymes, sometimes the males, often the females solitary; usually 4–5-merous, rarely 3-merous. *Sepals* connate in a frequently deeply lobed, rarely truncate calyx, often in the female larger than in the male, and often accrescent and plicate or auriculate in fruit. *Petals* connate in a shortly or deeply lobed tubular, hypocrateriform, or campanulate corolla; lobes contorted to right in bud. ♂ *Stamens* 4–64, often 16; filaments distinct, paired, or polyadelphous; anthers linear, rarely short. *Ovary* rudimentary. ♀ *Staminodes* 0–16. *Ovary* 4–5-celled or imperfectly or perfectly 8–10-celled; cells usually 1-ovuled, rarely 2-ovuled; styles or stigmas 1–4. *Fruit* a globose, ellipsoid, or ovoid-conic berry, often supported by the enlarged and sometimes woody calyx; flesh often pulpy or viscid. *Seeds* oblong, usually compressed; albumen equable or rarely ruminate.

*Female flowers solitary or subsolitary; if more than 2 together (*D. ovalifolia*, 2–6; *D. Embryopteris*, 1–5), then clustered, sessile :—[p. 652]

Calyx irregularly, or if regularly, then, at least in the male flower, very shortly cleft; corolla urceolate, glabrous externally; stamens usually more than 24; male flowers in small cymes; mature leaves glabrous beneath :—

Calyx in bud globular and closed, the lobes connate, but afterwards rupturing irregularly into 2–3-lobes; corolla 5-lobed; stamens about 32, glabrous; ovary hairy, 4-(rarely 6-)celled; stigmas 4, sessile; fruit ·7–1 in. across, ellipsoid, villous, but at length glabrate *Toposia*.

Calyx in bud not closed, in the male short, subtruncately 4-toothed, in the female large, deeply 4-lobed; corolla 4-lobed; stamens 24–64, pilose; ovary glabrous, 8-celled; styles 4; fruit *usually solitary*, 1–2 in. across, subglobose, glandular or rusty............*Embryopteris*.

Calyx regularly and deeply cleft, at least in the male flower, and usually in the flowers of both sexes (angled only in female calyx of *D. tomentosa*); stamens usually fewer than 24 :—

†Corolla urceolate, glabrous or nearly so externally, if pilose (*D. Kaki*) then only so on the lobes; calyx-lobes 4, ovate; fruit globose :—[p. 652]

‡Ovary glabrous; fruit glabrous; stamens 16 :—[p. 652]

Male flowers in small fascicles, subsessile; corolla small, nearly

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glabrous without; stamens glabrous; ovary 4-celled; fruit small, ·3 in. across; leaves hairy beneath ....*Chloroxylon.*

Male flowers in cymes, shortly pedicelled; corolla rather large; ovary 8-celled:—

Corolla quite glabrous externally; stamens glabrous; fruit distinctly pedicelled:—

Leaves glabrous beneath, glaucescent; fruit ·5–·75 in. across; an armed tree ....*montana.*

Leaves pubescent beneath; fruit 1–1·5 in. across; an unarmed tree.................................*montana* var. *cordifolia.*

Corolla-tube glabrate; lobes pubescent externally; stamens pilose; fruit sessile, 2–3 in. across, edible; leaves pubescent, reticulated beneath ....*Kaki.*

‡Ovary hairy; fruit glabrescent; stamens 13–22, glabrous or sparsely pilose; mature leaves glabrous beneath or nearly so:— [p. 651]

Male flowers in small fascicles, sessile; calyx-lobes deltoid; stamens 13–20, quite glabrous; ovary 2–6-celled; fruits (1–3 *together*) ·7 in. across; leaves quite glabrous beneath...*ovalifolia.*

Male flowers in cymes, shortly pedicelled; calyx-lobes rounded; stamens 13–22, glabrous or sparsely pilose; ovary 6–8-celled; fruit ·5 in. across; leaves almost glabrous ....*sylvatica.*

†Corolla tomentose or densely woolly both on lobes and tube externally:—[p. 651]

Male flowers in small fascicles, sessile; calyx 4-lobed; lobes ovate-apiculate; corolla salver-shaped, tomentose; stamens 14–16, glabrous; fruit ellipsoid, glabrous, narrowed at the base, 1·25 in. long, ·75–1 in. wide; leaves sparsely pilose beneath *stricta.*

Male flowers in cymes:—

Calyx in male flowers funnel-shaped, 4–5-lobed; lobes ovate; in female dissimilar, 4–5-angled; corolla urceolate, densely rusty-woolly; stamens 16; filaments glabrous, but connective fulvous-pilose on the back; styles 2–3, bifid; leaves large, ovate, dull, young hairy, mature glabrous above, hairy beneath; fruit globose, smooth, 1 in. across ....*tomentosa.*

Calyx deeply 4-lobed; corolla tubular, densely villous; stamens 22–24, quite glabrous; styles 4; leaves large, oblong, acute, shining, glabrous above, silvery-silky beneath; fruit ellipsoid, hairy, 2·5 in. long, 2 in. wide ....*discolor.*

*Female flowers in many-flowered cymes, much longer than the male cymes; calyx 5-lobed nearly half-way down; corolla tubular, villous externally; stamens 16, glabrous; ovary hairy, 8–12-celled; stigmas

CSL

4–6; fruit globular, glabrous, 2–3-in. across; leaves broad-oblong, acute, large, glabrous [p. 651] ....*ramiflora*.

1169. Diospyros Toposia Ham.; F. B. I. iii. 556; E. D. D. 664. *D. racemosa* F. I. ii. 536.
Chittagong.
A large or medium tree; leaves oblong, acuminate, coriaceous, alternate. *Vernac.* Gúlul.

1170. Diospyros Embryopteris Pers.; F. B. I. iii. 556; E. D. D. 582. *D. glutinosa* F. I. ii. 533.
In all the provinces.
A dense tree; leaves oblong, obtuse, or subacute, rounded or truncate at the base, coriaceous, alternate. *Hind.* and *Beng.* Gáb, makurkendi, téndú; *Uriya* Gusvakendhu; *Santal.* Makarkenda.

1171. Diospyros Chloroxylon Roxb.; F. I. ii. 538; F. B. I. iii. 560; E. D. D. 560.
Orissa.
A medium tree, sometimes spinescent; leaves elliptic or obovate oblong, narrowed upwards or acute, base obtuse or cuneate, chartaceous. *Vernac.* Anduli.

1172. Diospyros montana Roxb.; F. I. ii. 538; F. B. I. iii. 555; E. D. D. 628.
Behar; Chota Nagpur; Orissa.
A medium tree, usually spinescent; leaves ovate or oblong. *Hind.* Téndú, dasaunda, lohari; *Beng.* Bangáb; *Santal.* Sada terel.

1172/2. Var. cordifolia. *D. cordifolia* F. I. ii. 538.
In most of the provinces.
A medium tree, rarely spinescent; leaves herbaceous. Probably quite deserving to be treated as a distinct species.

1173. Diospyros Kaki Linn. f.; F. I. ii. 537; F. B. I. iii. 555; E. D. D. 600.
Planted only in our area.
A small tree, cultivated for its edible fruit; leaves ovate, obtuse, or narrowed at both ends, chartaceous.

1174. Diospyros ovalifolia Wight; F. B. I. iii. 557; E. D. D. 639.
Orissa.

A small tree; leaves elliptic or oblong, cuneate or subobtuse at both ends, coriaceous.

1175. Diospyros sylvatica Roxb.; F. I. ii. 537; F. B. I. iii. 559; E. D. D. 665.

Orissa; Chota Nagpur.

A medium tree; leaves elliptic or oblong, narrowed at both ends, herbaceous or chartaceous.

1176. Diospyros stricta Roxb.; F. I. ii. 539; F. B. I. iii. 563; E. D. D. 653.

Tippera.

A tall, slender, conical tree; leaves elliptic-lanceolate, acuminate, coriaceous.

1177. Diospyros tomentosa Roxb.; F. I. ii. 532; F. B. I. iii. 564; E. D. D. 656.

Behar; Chota Nagpur; W. Bengal.

A small gnarled tree; leaves usually wide-ovate, rarely ovate-acute, alternate and opposite, thickly coriaceous. *Hind.* Tumal, mitha tèndú; *Beng.* Kyon, kend; *Uriya* Kendhu; *Kol.* Tiril.

1178. Diospyros discolor Willd.; F. B. I. iii. 569; E. D. D. 567.

Cultivated in C. Bengal.

A tree; leaves oblong-acute, coriaceous.

1179. Diospyros ramiflora Roxb.; F. I. ii. 535; F. B. I. iii. 569; E. D. D. 648.

Tippera.

A large tree; leaves large, broadly oblong, acute, coriaceous. *Vernac.* Urigáb, gulúl.

Order LXXX. STYRACEÆ.

Trees or shrubs. *Leaves* alternate; stipules 0. *Flowers* hermaphrodite, in axillary or terminal, simple or panicled spikes or racemes, sometimes solitary; bracts small. *Sepals* connate in a superior or inferior campanulate calyx; limb 5–4-toothed or truncate, persistent. *Petals* 5 or 4, free or connate in a tube, imbricate. *Stamens* adnate to the petals, 8 or 10 or numerous; filaments free or connate; anthers globose or linear; dehiscence lateral. *Carpels* connate in a 2–5-celled, inferior or superior ovary, occasionally, by early separation of the septa from the axis,

GSL

1-celled; ovules 1 or few on the inner angle of each cell, pendulous or erect; style filiform; stigma small or capitate. *Fruit* indehiscent, drupaceous, 1-seeded, or occasionally 2–3-seeded. *Seeds* with thin testa; albumen fleshy or sometimes hairy; embryo straight or curved.

Stamens many, in several rows ....**Symplocos.**
Stamens ten, in a single row ....**Styrax.**

529. **Symplocos** Linn.

Trees or shrubs; *leaves* alternate, toothed or entire, often rather pale green. *Flowers* hermaphrodite, white, in axillary, simple or compound racemes or spikes, sometimes reduced to a single flower; bracts usually solitary at base of each pedicel, caducous; bracteoles 3–1, small, at base of flower. *Sepals* connate in a calyx, with 5 small, imbricate lobes; tube adnate to ovary. *Petals* 5, imbricate, free or slightly connate, rarely connate in a distinct tube. *Stamens* many, several-seriate, adnate to corolla-tube, usually throughout its length, sometimes connate in a tube beyond the corolla; anthers shortly oblong. *Carpels* connate in an inferior, 3-celled, rarely 2- or 4-celled ovary; style filiform; stigma small, capitate, sub-3-lobed; ovules 2, pendulous from inner angle of each cell. *Fruit* an ellipsoid drupe; endocarp usually woody, 1–3-seeded. *Seed* oblong, straight, or occasionally curved; embryo axial.

Flowers in racemes; stamens sometimes 100 or more.............*racemosa.*
Flowers in small cymes, subterminal on the branches; stamens about 40
racemosa var. *composita.*

1180. SYMPLOCOS RACEMOSA Roxb.; F. I. ii. 539; F. B. I. iii. 576; E. D. S. 3062.
Behar; Chota Nagpur.
A shrub or small tree. *Vernac.* Lodh.

1180/2. Var. COMPOSITA F. B. I. iii. 577.
N. Bengal, Duars.
A shrub.

530. **Styrax** Linn.

Trees or shrubs; *leaves* elliptic, lanceolate. *Flowers* in lax, little-divided axillary and terminal racemes, occasionally solitary, axillary; bracts inconspicuous. *Sepals* connate in a campanulate, truncate, or 5-toothed calyx, free or slightly adnate to base of ovary. *Petals* 5, connate in a short tubular corolla; lobes elliptic-oblong, imbricate. *Stamens* 10, 1-seriate, adnate to summit of corolla-tube; filaments short; anthers large, linear. *Carpels* connate in a nearly free ovary, at first 3-celled, often at length 1-celled; style subulate; stigma capitate; ovules few in each cell. *Fruit* a globose or ellipsoid, tough capsule, seated on the cup-shaped calyx, breaking up irregularly. *Seeds* by abortion solitary, rarely 2, erect; testa papery or hard; albumen fleshy, copious; embryo straight, with broad cotyledons.

1181. STYRAX SERRULATUM Roxb.; F. I. ii. 415 var. AGRESTIS F. B. I. iii. 589; E. D. S. 2981.

N. Bengal, Duars.

A small tree. *Beng.* Kum-jameva.

Order LXXXI. OLEACEÆ.

Trees or shrubs, unarmed, erect or climbing. *Leaves* opposite, very rarely alternate, simple, 3-foliolate or pinnate, entire or toothed; stipules 0. *Flowers* hermaphrodite, often dimorphous, sometimes polygamous or diœcious, regular, usually in 3-chotomous cymes or panicles, terminal or axillary, rarely fascicled or racemose. *Sepals* connate in a small truncate or 4-lobed, sometimes 5–6-lobed calyx, rarely 0. *Petals* rarely 0 or free, usually 4–6, connate in a gamopetalous corolla, with long or short tube; corolla-lobes or free petals imbricate or valvate. *Stamens* 2, inserted on corolla-tube, or hypogynous if petals free or 0; filaments usually short; anthers oblong, dehiscing laterally or sub-extrorsely. *Carpels* connate in a free, 2-celled ovary; ovules 1–2, rarely 3–4 in each cell, attached to inner angle near apex or base. *Fruit* a loculicidal capsule or a dry or succulent berry or drupe. *Seeds* solitary or 2 in each cell, erect or pendulous; testa thin or bony; albumen fleshy, horny or 0; embryo straight; radicle inferior or superior.

*Corolla-lobes imbricate in bud, usually more than 4 in number; seeds not albuminous:—[p. 657]

†Fruit a 2-lobed, or, by abortion, 1-lobed drupe; scandent, rarely erect or suberect shrubs, with either simple or compound leaves; seeds erect; radicle inferior [p. 657] ....**Jasminum.**

1193. LINOCIERA INTERMEDIA Wight var. ROXBURGHII Clarke ; F. B. I. iii. 609 ; E. D. L. 377. *Olea paniculata* F. I. i. 105.

Chota Nagpur ; Orissa.

A small tree, 25 feet high.

1194. LINOCIERA TERNIFOLIA Wall. var. ACUMINATA Clarke F. B. I. iii. 610.

Chittagong.

A tree.

535. **Olea** Linn.

Trees or shrubs ; *leaves* opposite, entire or toothed. *Flowers* small, hermaphrodite, diœcious or polygamous, in axillary or terminal panicles ; bracts minute. *Sepals* connate in a small, 4-toothed or 4-lobed calyx. *Petals* 4, connate in a very short tube, induplicate-valvate ; or 0. *Stamens* 2, adnate to corolla-tube or subhypogynous ; filaments short ; anthers oblong. *Carpels* connate in a 2-celled ovary ; style short ; stigma ovate or shortly 2-lobed ; ovules in each cell 2, subpendulous or laterally attached to the septum. *Fruit* an ellipsoid or subglobose drupe ; endocarp bony or crustaceous, usually 1-seeded. *Seed* pendulous ; albumen fleshy ; radicle superior.

1195. OLEA DIOICA Roxb. ; F. I. i. 106 ; F. B. I. iii. 612 ; E. D. O. 153.

N. Bengal, Duars ; Chittagong.

A tree, 30–60 feet high. *Beng.* Atta-jam.

536. **Ligustrum** Linn.

Shrubs or trees ; branchlets often lenticellate ; *leaves* opposite, entire, glabrous when mature. *Flowers* white, in terminal panicles, with sometimes foliaceous bracts in the lower part. *Sepals* connate in a small, truncate, or shortly 4-toothed calyx. *Petals* 4, connate in a funnel-shaped corolla ; tube long or short ; lobes induplicate-valvate. *Stamens* 2, adnate to corolla-tube ; filaments short ; anthers oblong or rounded. *Carpels* 2, connat in a 2-celled ovary ; ovules in each cell 2, laterally affixed near top ; style rather long ; stigma subclavate, oblong, hardly *Fruit* a 1–3-seeded drupe ; endocarp chartaceous or thin pendulous ; testa thin ; albumen fleshy ; radicle superio

1196. LIGUSTRUM ROBUSTUM Blume ; F. B. I. iii. 614

busta F. I. i. 101.

engal ; Chittagong.

ree, 60 feet high. *Vernac.* Bhu

537. Myxopyrum Bl.

Large scandent shrubs; branches 4-angled; *leaves* opposite, large, coriaceous, 3-nerved, entire or toothed. *Flowers* small, yellowish, in many-flowered, axillary and terminal trichotomous panicles; bracts minute or 0. *Sepals* connate in an acutely 4-lobed calyx. *Petals* 4, connate in a corolla, with tube longer than calyx; lobes concave, oblong or spathulate, induplicate-valvate in bud. *Stamens* 2, adnate to corolla-tube; filaments short; anthers ovate. *Carpels* 2, connate in a 2-celled ovary; ovules 1–2 in each cell, attached near base of inner angle; style very short; stigma 2-lobed. *Fruit* a subglobose 1-seeded, or obovoid 2-seeded berry, with crustaceous pericarp. *Seed* ascending; testa thin; albumen horny; radicle inferior.

1197. Myxopyrum smilacifolium Bl.; F. B. I. iii. 618.
N. Bengal, Duars; Chittagong.
A scandent shrub.

Order LXXXII. SALVADORACEÆ.

Trees or shrubs, unarmed or spiny. *Leaves* opposite, entire; stipules rudimentary, setiform. *Flowers* small, diœcious or polygamo-dimorphic, clustered or panicled. *Sepals* connate in a free, campanulate or ovoid calyx; limb 3–5-toothed or -lobed. *Petals* 4, free or connate in a shortly campanulate tube; imbricate in bud. *Stamens* 4, on the corolla-tube or, when petals free, hypogynous, alternate with the petals; filaments free or connate in a tube; anthers ovate, dorsifixed; connective apiculate or not; dehiscence longitudinal, lateral. *Carpels* connate in a free, 1–2-celled, or imperfectly 4-celled ovary; ovules 1–2 in each cell, basal, erect, anatropous; style short; stigma 2-fid or subentire. *Fruit* a berry or drupe, usually 1-seeded. *Seed* erect, globose; men 0; testa thin or cartilaginous; cotyledons thick, cordate base.

rmed trees or shrubs; corolla gamopetalous; stamens on
ovary 1-celled, 1-ovuled ....Salvador
bs with axillary spines; petals not united; sta
usly 4-celled; cells 2–1-ovuled ....

CSL

538. Salvadora Linn.

s or trees; *leaves* opposite, entire. *Flowers* small, her-
rodite, or functionally 1-sexual, in panicled racemes or
es; bracts minute. *Sepals* 4, connate in a campanulate
yx; lobes imbricate. *Petals* connate in a campanulate corolla;
be with usually 4 small teeth between the bases of the fila-
ents; lobes 4, imbricate. *Stamens* 4, adnate to corolla and
ternate with its lobes. *Carpels* connate in a 1-celled ovary;
vule solitary, erect, basal; style 0; stigma truncate. *Fruit* a
lobose drupe, supported by the slightly accrescent calyx and
rcescent corolla; endocarp crustaceous. *Seed* erect, globose;
umen 0.

1198. SALVADORA PERSICA Linn.; F. I. i. 389; F. B. I. iii. 619; E. D. S. 705.

Western Behar; sometimes planted elsewhere.

A small tree. *Vernac.* Jhal.

539. Azima Lamk.

Rambling shrubs with axillary spines; *leaves* opposite, entire. *Flowers* small, diœcious, axillary, sessile, or clustered or umbellate on sparingly branched panicles; bracts 0 or foliaceous; bracteoles small, linear. *Sepals* connate in a campanulate, 4-fid, or irregularly 2–4-lobed calyx. *Petals* 4, oblong, imbricate. ♂ *Stamens* 4, alternate with petals, hypogynous; filaments linear; anthers acute. ♀ *Carpels* 2, connate in a 2-celled ovary; ovules 2 or 1 in each cell, erect, basal; stigma subsessile, large, 2-fid. *Fruit* a globose, 2- or 1-seeded berry; endocarp membranous. *Seed* lobose; albumen 0.

199. AZIMA TETRACANTHA Lamk; F. B. I. iii. 620; E. D. A. 1165.

Orissa; Sundribuns.

A glabrous, rigid, rambling shrub. *Hind.* Kantagurkamai; *Beng.* Trikanta-gati.